



National Library
of Canada

Acquisitions and
Bibliographic Services Branch

395 Wellington Street
Ottawa, Ontario
K1A 0N4

Bibliothèque nationale
du Canada

Direction des acquisitions et
des services bibliographiques

395, rue Wellington
Ottawa (Ontario)
K1A 0N4

1-800-387-0000

1-800-387-0000

NOTICE

The quality of this microform is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us an inferior photocopy.

Reproduction in full or in part of this microform is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30, and subsequent amendments.

AVIS

La qualité de cette microforme dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de qualité inférieure.

La reproduction, même partielle, de cette microforme est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30, et ses amendements subséquents.

Canada

Industry and space: the making of Montreal's industrial
geography, 1850-1918

Robert David Lewis

Department of Geography
McGill University
Montreal

December 1992

A Thesis submitted to the Faculty of Graduate Studies and Research in partial
fulfillment of the requirements of the degree of Ph.D.

© Robert David Lewis, 1992



National Library
of Canada

Acquisitions and
Bibliographic Services Branch

395 Wellington Street
Ottawa, Ontario
K1A 0N4

Bibliothèque nationale
du Canada

Direction des acquisitions et
des services bibliographiques

395, rue Wellington
Ottawa (Ontario)
K1A 0N4

Yours faithfully,
/

Yours faithfully,
/

The author has granted an irrevocable non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of his/her thesis by any means and in any form or format, making this thesis available to interested persons.

L'auteur a accordé une licence irrévocable et non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de sa thèse de quelque manière et sous quelque forme que ce soit pour mettre des exemplaires de cette thèse à la disposition des personnes intéressées.

The author retains ownership of the copyright in his/her thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without his/her permission.

L'auteur conserve la propriété du droit d'auteur qui protège sa thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

ISBN 0-315-87635-2

Canada

Shortened version of the thesis title of the
Ph.D. of Robert David Lewis

Industry and space: the making of Montreal's industrial geography

Abstract

The purpose of this thesis is to explore several issues regarding the industrial geography of the North American city between 1850 and 1918, using Montreal as a case-study. The two dominant locational theories (Weberian and transactional) are critiqued and three problems are identified: their reliance on simplistic conceptions of industrial organization; their inability to take account of cycles of investment; and their neglect of the social construction of the built environment. A reformulation of urban industrial geography is presented which stresses the diversity of productive strategies open to industries; the relationship of these strategies to rhythms of changes to technology, the labour process, and the organizational structure of firms; and the actions of local growth machines in the making of industrial space. These claims are developed through an empirical examination of Montreal. Using the municipal tax assessment rolls a description of the location of Montreal's manufacturing firms in 1861 and 1890 establishes the context for a discussion of the key dynamics of the city's industrial geography through histories of selected industries (clothing, metal, cotton, and baking) and industrial districts (Saint-Ann and Saint-Henri).

Résumé

Cette thèse étudie divers aspects de la géographie industrielle des villes nord-américaines entre 1850 et 1918, à partir du cas type de Montréal. Elle offre une critique des deux théories principales de l'emplacement des industries (théorie weberienne et théorie transactionnelle) dont sont signalés trois défauts: leur application de divers concepts simplistes en ce qui concerne l'organisation industrielle; leur inaptitude à prendre en compte les cycles d'investissement; et enfin leurs carences en matière de production sociale de l'espace bâti. Cette thèse propose une reformulation de la géographie industrielle urbaine, mettant en relief la diversité des stratégies de production réalisables par les industries, les rapports entre ces stratégies et l'évolution de la technologie, l'organisation du travail, ainsi que la structure organisationnelle des entreprises, et, enfin, les effets des coalitions d'entrepreneurs locaux sur la création d'un espace industriel. Ces propos sont donc développés à l'aide d'une étude du cas empirique de la ville de Montréal. Une description du lieu d'implantation des entreprises montréalaises en 1861 et 1890, basée sur le rôle d'évaluation municipal, ouvre la voie à une discussion apropos de transformation de la géographie industrielle de la ville de Montréal, à travers le développement historique d'industries diverses (habillement, métallurgie, coton et boulangerie) et de divers quartiers industriels (Saint-Ann et Saint-Henri).

TABLE OF CONTENTS

Abstract	i	
Résumé	ii	
Table of Contents	iii	
List of Tables	vi	
List of Figures	vii	
Preface	ix	
Acknowledgements	xi	
Chapter 1	Historical and Industrial Geography of the North American City, 1850-1918	1
1.1	The aim of the thesis	1
1.2	Recent debates in social theory	5
	Historical geography and social theory	6
	Historical geography and intra-urban industrial geography	10
	Historical geography, industry and history	14
1.3	Methodology and outline of thesis	20
	Theory and method in historical geography	20
	Case studies and method	27
	The issue of scale	30
1.4	Sources	34
Chapter 2	Perspectives on Urban Industrial Geography, 1850-1918	40
2.1	Introduction: centralization and decentralization in industrial geography	40
2.2	The Weberian tradition	46
2.3	Allen Scott and transactional theory	55
2.4	Conclusion	61
Chapter 3	Production Formats	64
3.1	The corporation as agent of change	64
3.2	Divergent paths and production formats	71
	Technological change	76
	Labour process	86
	Production organization	91
3.3	Urban development, long waves of growth and localities	99
	Long waves and urban form	100
	Long waves and localities	107

Chapter 4	The Formation of Industrial Districts	121
4.1	Introduction	121
4.2	Industrial districts	125
4.3	Industrial spaces and production formats	131
	Production formats and urban industrial structure	132
	Industrial districts and waves of growth	147
4.4	Industrial districts and the built environment	153
	Some perspectives on the making of the built environment	154
	Local alliances and the making of the built environment	159
4.5	Conclusion: a range of industrial districts	166
Chapter 5	Industry and Space in Montreal, 1851-1881	171
5.1	Expansion of industry in Montreal	171
5.2	New production formats and manufacturing strategies	176
	Different trajectories of growth	177
	A variety of production formats	194
5.3	Restructuring of urban space	199
	New infrastructures	200
	Housing and land development	204
5.4	Old Montreal and the Outer Core: agglomeration and productive strategies	209
	Agglomeration economies, production formats and locational assets	211
	The clothing industry: productive strategies and central spaces	226
	Adaption and conversion of the built environment	236
	Growth of the Outer Core	244
5.5	The East End: a mid-nineteenth century industrial district	250
	The beginnings of an industrial district	250
	Consolidation and growth in the 1870s	255
5.6	The West End: new productive strategies and the growth of an industrial district	263
	Early development of Saint-Ann	265
	The transformation of Saint-Ann's industry after mid-century	268
	The changing industrial geography of Saint-Ann	282
Chapter 6	Industry and Space in Montreal, 1871-1918	293
6.1	A new industrial front	293
6.2	Diverse industries, scale and productive practices	305
	Cotton and a large-scale, continuous-processing strategy	312
	Metal and the diversity of productive strategies	317
	Baking: mechanized and artisanal productive strategies	331
6.3	Industrial spaces, 1871-1918	335

	Electricity and spatial divisions of labour	336
	The state, local alliances and new social spaces	344
6.4	The changing industrial geography of Old Montreal and the Outer Core	353
	The relative decline of Old Montreal	355
	The continued diversity of Old Montreal	356
	Printing in Old Montreal	361
	Expansion and diversification of the Outer Core	366
	Carriage-making and the Outer Core	374
6.5	The East End: new manufacturing forms and new districts	378
	New forms of manufacturing and constellations of industry	381
	Maisonneuve and the restructuring of the shoe industry	392
6.6	The West End: industrial restructuring and the making of industrial spaces	407
	The restructuring of the flour industry	409
	New productive spaces in the western suburbs	416
	Early development of Côte Saint-Paul	417
	Political regulation of and industrial development in Saint-Henri and Sainte-Cunégonde	425
	New rounds of industrialization in the western suburbs	432
	The movement of large firms to the western suburbs: three illustrations	439
	Agglomeration in the western suburbs	455
	The western suburbs, tax exemptions and local alliances	459
	Chapter 7 Conclusion	467
7.1	The problem and the argument	467
7.2	Social divisions of manufacturing	469
7.3	Spatial divisions of manufacturing	475
	Appendices	485
Appendix 1	Montreal Manufacturing Firms by Cell, 1861 and 1890	486
Appendix 2	Montreal Manufacturing Firms by the Standard Industrial Classification System, 1861 and 1890	487
Appendix 3	Montreal Manufacturing Firms by Districts and Sectors, 1861 and 1890	490
	Bibliography	493

List of Tables

5.1	Manufacturing Firms by Sector in Montreal, 1861-1881	178
5.2	Fixed Capital and Employment in Selected Industries in Montreal, 1871	186
5.3	Montreal Manufacturing Firms by District, 1861	212
5.4	Rent Characteristics of Selected Industries in Old Montreal and the Outer Core, 1861	220
5.5	The Occupants of the Hôtel Dieu Warehouses, 1881	240
5.6	The Occupants of the Grey Nun Warehouses, 1881	243
5.7	Factories in Saint-Ann, 1831-1856	267
5.8	Manufacturing Firm Size in Saint-Ann, 1851-1881	271
5.9	Construction Expenditure on the Lachine Canal, 1840-1889	289
6.1	Manufacturing Firms by Sector and Rent, Montreal 1890	306
6.2	Montreal Textile, Metal and Baking Sectors, 1890	313
6.3	Productive Strategies in Selected Metal Firms	320
6.4	Montreal and Suburban Population, 1881-1911	345
6.5	Montreal Manufacturing Firms by Districts, 1890	354
6.6	Inventory of the Shops of the Montreal Locomotive and Machine Company, 1903	389
6.7	Maisonneuve's Industry, 1918	397
6.8	Rent of the Lachine Canal Flour Mills, 1861-1907	412
6.9	Industry on the Lachine Canal at Côte Saint-Paul, 1855-1874	422
6.10	Industrial Growth in Saint-Henri and Sainte-Cunégonde, 1871-1901	434
6.11	The Industrial Structure of the Western Suburbs, 1890 and 1918	438
6.12	Firms that Moved From Montreal to the Western Suburbs, 1850-1918	460

List of Figures

3.1	The Classic Cases of Production Formats	75
4.1	Investment Cycles in Montreal, 1848-1914	124
5.1	Box Plots of Montreal Manufacturing Rents by Sector, 1861	180
5.2	Distribution of Sizes of Rents in Sectors Based on Their Manufacturing Rent, Montreal 1861	184
5.3	Expansion of the Redpath Sugar Refinery Plant, 1856-1881	192
5.4	Montreal, 1861	207
5.5	Owen McGarvey Store and Factory, 1891	218
5.6	Leading Sectors in Old Montreal and the Outer Core by Total Rent and Number of Firms, 1861	219
5.7	Location of Shoe, Printing and Clothing Firms in Old Montreal and the Outer Core, Montreal 1861	224
5.8	Changes to the Hôtel Dieu Land in Old Montreal, 1852-1881	239
5.9	Changes to the Grey Nun Land in Old Montreal, 1852-1881	242
5.10	The Location of Carriagemaking Firms in Old Montreal and the Outer Core in 1861	247
5.11	Location of Manufacturing Firms in Sainte-Marie, 1861 and 1881	254
5.12	The Hudon Cotton Mill, 1882	259
5.13	Saint-Ann Manufacturing Firms by Rent, 1851-81	270
5.14	Location of Manufacturing Firms in Saint-Ann, 1851 and 1881	273
5.15	View of the Redpath (Canada) Sugar Refinery, Circa 1856	274
5.16	Saint-Ann Manufacturing Firms by Area, 1851-1881	284
6.1	Twenty Largest Manufacturing Firms in Montreal, 1890	308
6.2	Distribution of Sizes of Rents in Sectors Based on their Manufacturing Rents, Montreal 1890	311
6.3	Montreal, 1901	346
6.4	Leading Sectors in Old Montreal and the Outer Core by Total Rent and Number of Firms, 1890	357
6.5	Location of Printing and Carriagemaking Firms in Old Montreal and the Outer Core, 1890	365
6.6	Location of Tobacco Firms, 1890 and 1916	371
6.7	Some Views of the Canadian Rubber Company, 1889	380
6.8	The Dominion Oil Cloth Company, 1906	386
6.9	Plan of the St. Lawrence Sugar Refinery, 1900	394
6.10	Leading Sectors in Lachine and Griffintown by Total Rent and Number of Firms, 1890	410

6.11	The Ogilvie Flour Mills, 1889	415
6.12	Plan of Frothingham and Workman Premises at Côte Saint-Paul, 1880	421
6.13	Location of the Largest Firms in the Western Suburbs, 1890 and 1918	436
6.14	The Montreal Rolling Mills, 1868	443
6.15	Imperial Tobacco Building, Saint-Henri, 1907	453

Preface

In this thesis I make several contributions to original knowledge. First, I present a critique of the two most important perspectives on intra-metropolitan industrial location in the North American city between 1850 and 1918 (the least-cost theory of Weber and transactional theory of Scott). Second, developing out of this critique I present a reformulation of urban location theory which incorporates the notions of industrial organization (specifically technological change, the labour process, and production organization), long waves of growth, and the construction of urban space. Third, associated with this is the development of the concept of production formats through which I present a more nuanced picture of the organizational structure of industry in the period rather than the polarized framework utilized by most other writers. Specifically, I show that a variety of productive strategies were open to firms and that this had an important bearing on the changing character of urban industrial geography. Fourth, another contribution lies in the links made between the generalizations of long waves and the unique character of place. Drawing upon the concept of growth machines (or local alliances), I show the mechanisms connecting the structural features of industrial growth to the social interrelationships behind the construction of Montreal's industrial built environment. Fifth, through a combination of extensive and intensive research strategies I present an examination of Montreal's industrial geography between 1850 and 1918. The empirical research of Montreal undertaken in this thesis contributes to original knowledge in three major ways: i) as an illustration, in

contrast to the generalizations most other writers have provided, of the complexity of the geography of urban industrial space; ii) the presentation of some key dynamics behind the evolution of Montreal's industrial geography (through detailed case studies of Saint-Ann and the western suburbs, as well as less detailed ones of Old Montreal, Sainte-Marie, Hochelaga and Maisonneuve); and iii) intensive analysis of the different trajectories of growth that industries could take (through case studies of the metal, cotton, baking, clothing, carriagemaking and printing industries).

Acknowledgements

If only I had known, I would never ... The task of finishing a dissertation is probably never achieved. Even at this time, I want to rewrite that paragraph, add to that section, and, of course, completely restructure and rethink the entire thesis. This would be completely unacceptable to the two people who have helped me write as well as suffered the most through this thesis. For a decade and from Masters to doctorate, Sherry Olson has been an exemplar of patience, inspiration, warmth and support. In her wisdom she has known when to leave me alone and when to get irritated with me. Her constant encouragement and belief in my work and her continual support through the vicissitudes of everyday graduate life, despite her own immense work-load and responsibilities, provided me with the type of aid that has made this work come to fruition. The bitterness of the fruit is, of course, my doing. Lisa, throughout the trials and tribulations of university and home, has been a constant friend and support. Throughout the vales of tears (writing block, confusion, and general despair) she was always there, even though she had to juggle her own thesis, work and home duties, prodding me on and often showing me the way. Many times she took over the family responsibilities that should have been mine, thus giving me some more room to breathe. For this and all the other things I thank her from the depths of my heart.

Other people provided help in all sorts of ways. Both Damaris Rose and Brian Young made many insightful and practical comments on the thesis, and were there when I had need of them. While John Bradbury was only on my committee for a

short period, his presence was keenly felt and appreciated. David Hanna was a wonderful companion to have on the treks out to the various city halls of Montreal's west end and a support in many other ways. Pat Thornton, Brian Slack, Lourdes Meana and the rest of the team at Concordia provided me with a great deal of logistical support and an early appreciation of my data collection. I would also like to thank Aaron Freeman and Wendy de Souza for their cartographic skills; they transformed grubby messes into very presentable maps.

Several institutional libraries were helpful and I thank them. I would like to particularly acknowledge the help of the staff at the library of the Imperial Tobacco Company in Montreal who gave me unlimited access to the Canadian Cigar and Tobacco Journal and to one of the last refuges of institutionalized smoking; the staff at McLennan Rare Books went out of their way to find the maps, the directories and the various other oddments that the thesis depended upon; and the staff at McLennan inter-library loan who spent so much time and patience seeking out the journals, that even despite their best efforts, were not to be found; and the staff at the La Société historique de Saint-Henri who gave me unlimited access to their collection. I would also like to thank the McGill geography staff - Marie, Ann, Wendy and Angie - who over the years have provided me, and countless other students, with marvellous care and service.

I would also like to thank the Fonds pour la Formation Chercheurs et l'Aide à la Recherche and McGill University for the scholarships which supported me through first years of my doctoral research.

Lastly, I thank my sons - Yonah, born at the beginning of the thesis, and Lev, born near the end - for their support that came in many guises. Principally, their dedicated yearning and lust for life (from home-wrecking to wonder at everyday life) was a heart-warming and inspiring lesson into the balances between home and work, a lesson I often forgot. Although this dissertation took a large chunk of me from them, I hope that this thesis is some small was can repay them for that loss.

CHAPTER 1

HISTORICAL AND INDUSTRIAL GEOGRAPHY OF THE NORTH AMERICAN CITY, 1850-1918

1.1 The Aim of the Thesis

The purpose of this thesis is to investigate the dynamics giving rise to the making of North American urban manufacturing districts between 1850 and 1918. In order to achieve this I pursue two aims. The first is to present a reformulation of the historical geography of urban industry which emphasizes the existence of a wide range of productive strategies and the active creation of manufacturing districts. A theoretical approach is presented which emphasises the connections between economy and space, where neither is assumed to determine the other. The second aim is to provide a case study of the industrial geography of a North American city in this period. In this case, it happens to be Montreal, the premier industrial city of Canada in the period under consideration.

The reason for this study lies in the fact that neither geographers nor historians have written very much about the actual mechanisms and dynamics of industry underlying the formation of industrial space in the nineteenth and early twentieth-century North American city. Although scholars have made several assertions concerning the character of industry and the location of urban industrial districts, they have presented a limited number of detailed local studies of the relationship between industry and industrial space. In order to specify more fully this relationship, I ask two major questions. Is the traditional understanding of the industrial geography of the nineteenth and twentieth-century city a valid one? If not, how is the industrial geography of the city to be interpreted?

Much of the existing literature contends that two features of the industrial geography of the city in this period are particularly well known and need little theoretical or empirical reworking. Geographers, economists, and regional scientists purport to have shown that production before World War I was tightly clustered in the core of the central city, and that the movement of manufacturing firms from the core to suburban sites and to surrounding towns began after World War I. Historians have echoed these findings with snapshots of cities such as Boston and Philadelphia. As a corollary, scholars have also accepted a simple three-stage theory of the North American city in this period where changes to spatial structure correspond to changes to economic and social processes. These stages are seen to be differentiated from one another by their economic and social processes and geographies.

The validity of these two propositions about the North American city is open to question. Each has its own particular problems. In the first place, the location of industry in the city since 1850 has been little studied. It is true that geographers have made a number of generalizations about the location of industry and the dynamics underlying industry's spatial coordinates.¹ One of the most common is the splitting of urban industrial space into two spheres - the core and the periphery (or suburbs) - characterized by differences of industrial content over time. Historians have also,

¹ D. Ward, Cities and Immigrants (New York: Oxford University Press, 1971); R.A. Walker, "The transformation of urban structure in the nineteenth century and the beginnings of suburbanization" in K. Cox (ed.), Urbanization and Conflict in Market Societies (Chicago: Maaroufa, 1979), pp. 165-212 and "A theory of suburbanization: capitalism and the construction of urban space in the United States" in M. Dear and A.J. Scott (eds.), Urbanization and Urban Planning in Capitalist Society (New York: Methuen, 1981), pp. 383-429; A.J. Scott, "Locational patterns and dynamics of industrial activity in the modern metropolis", Urban Studies, 1982, 19, pp. 111-142.

although less systematically and usually as a secondary concern, made suggestions as to the development of the city's industrial structure in this period.² But neither geographers nor historians have generated a series of detailed studies of the industrial geography of particular North American cities. Conclusions about the location of industry and its underlying dynamics have been drawn from data extracted at a scale inappropriate to creating an incisive profile of the city's industrial geography. In the case of the internal structure of urban industrial geography, the conventionally-drawn scales of ward boundaries, and city and suburbs are not fine grained enough to discover the intricate contours of productive space.³ These generalizations drawn from scale-dependent data sources have been buttressed by ahistorical conceptions of industrial structure and of the forces which are responsible for industry's spatial dynamics. These usually take the form of a dualistic division of industry into small, labour-intensive firms versus large, capital-intensive firms. Further, the treatment of urban industrial geography, revolving as it does around the reconstruction of snapshots at widely spaced intervals, as shaped by the dynamics of economic processes acting within a dualistic framework has severely limited the appraisal and analysis of industrial restructuring.

² Two important studies which pay some attention to the spatial contours of urban industrial growth are S.B. Warner, The Private City: Philadelphia in Three Periods of its Growth (Philadelphia: University of Pennsylvania Press, 1968) and O. Zunz, The Changing Face of Inequality (Chicago: University of Chicago Press, 1982).

³ The fact that the scale at which one sets the field of inquiry has a great deal to do with the findings of the research has been pointed out by C.J. Pooley, "Residential differentiation in Victorian cities: a reassessment", Transactions. Institute of British Geographers, N.S., 1984, 9, pp. 131-144. The point is not that one should be discouraged from choosing a scale to work at, but that one must carefully choose a scale(s) that best answers the questions posed.

Generalizations concerning urban industrial structure have then been deduced from crude conceptions of industrial and spatial structures, 'proven' by a simplified representation of industry at one point in time, and then used to infer the great sea-changes to the transformation of urban structure. Scholars have posited two major transformations in the period between 1850 and 1929.⁴ The first, occurring at the middle of the nineteenth century, was associated with the transition from the mercantile city to the industrial city and involved the growing separation of classes and the emergence of specialized economic land uses. The second took place at the end of the century as the emergence of corporate capitalism gave rise to a new urban form. The corporate city differed in fundamental ways from the preceding industrial city. It was in this period that the beginnings of the transformation of the city's industrial geography, it is argued, can be discerned; strong centrifugal forces pushed out larger firms to the urban periphery, in the process creating a polarized industrial spatial structure. Although there would appear to be little reason to argue with the broad description of the transformation of the North American capitalist city, the same cannot be said for the manner in which the generalizations are used to understand the separate components that make up the model or to comprehend the specific character of individual cities. This, however, is what geographers have done. The broad brush strokes of long-term change have been used to conceptualize the

⁴ J. Borchert, "American metropolitan evolution", Geographical Review, 1967, 62, 3, pp. 301-332; P.O. Muller, Contemporary Suburban America (Englewood Cliffs: Prentice-Hall, 1981); E. Soja, R. Morales and G. Wolff, "Urban restructuring: an analysis of social and spatial change in Los Angeles", Economic Geography, 1983, 59, pp. 195-230; Walker, "The transformation of urban structure" and "A theory of suburbanization".

theoretical and methodological questions that geographers have pursued, and to describe and explain the intricate details of the various building blocks for understanding urban structure.

It should be evident by now that I believe a reassessment of the historical geography of urban industry is long overdue. Problems associated with the theoretical and methodological approach to industry and space in the nineteenth and early twentieth-century city raise a critical question. If the conventional understanding of urban industrial geography between 1850 and 1918 is not a valid one, what needs to take its place? In this thesis I attempt to create a reformulation which centres around three other questions. In what ways can technology, the labour process and the organization of production be incorporated into a reformulation that takes account of their multiple forms? What was the impact of economic cycles of differing length upon the layered urban geography? How can the notion of the social construction of space be integrated with the economic to produce a non-deterministic picture of the making of urban industrial space? Recent debates in social theory have provided some important and useful contributions to answering these questions.

1.2 Recent Debates in Social Theory

Obviously, we do not want to return to the days of empiricism uninformed by theory; rather, we seek a reflexive relationship between theory, analysis, and archival and field research and between research undertaken at different scales.⁵

⁵ R. Dennis, "History, geography, and historical geography", *Social Science History*, 1991, 15, 2, p. 281.

To flesh out the reasons for the reassessment I will now turn to a discussion of three recent developments that underlie my reasoning. They are the development of new theoretical positions which have made closer connections between social theory and historical geography; recent reformulations of the dynamics of intra-urban industrial geography and their relation to the historical geography of North American urbanization; and the construction of new themes and methodologies in social and labour history.

Historical geography and social theory

New writings in social theory have widened the scope of geographic inquiry and laid out a biting critique of the epistemological underpinnings of historical geography. Until recently, for the most part, our understanding of historical urban geography was firmly ensconced within positivist approaches. Under the general heading of 'new human geography' are a wide range of new theoretical perspectives such as post-modernism and post-structuralism which attempt to bypass the restrictions of paradigms that have traditionally been central to geography. The recent discussions around humanism and historical materialism, particularly, have heralded new ways of understanding the historical contours of our geographical past.⁶ Although post-structuralist theory has taken a number of directions, a central theme has been a reformulation of the relationship between society and space, or

⁶ These two philosophical positions are exemplified in the collection of articles in Period and Place: Research Methods in Historical Geography (Cambridge: Cambridge University Press, 1982) edited by A.R.H. Baker and M. Billinge and in Remaking Human Geography (Boston: Unwin Hyman, 1989) edited by A. Kobayashi and S. Mackenzie.

what several writers have called the "social production of space".⁷ Central to this is the assertion that space is neither separate from nor subordinate to social relations.⁸ According to this view the classical conceptions of the relationship between society and space, and the linkages between them are rooted in a functionalist interpretation of economic and spatial change. A defining feature of these conceptions of society and space is the idea that spatial relations are passive: space is simply a container for the active processes of society. Writers may disagree just what the essential motor of society is, but nevertheless, the end result is always the same: some form of social determinism gives rise to the spatial configurations of society. Contrary to this, and in line with critiques of essentialist notions of empiricism and rationalism, which have questioned the tendency to reduce the explanation of the multiple and overdetermined dimensions of society to a single cause have been questioned⁹, I would argue that the historical geography of urban society is open-ended and characterized by different trajectories of change and replete with conflict and

⁷ M. Gottdiener, The Social Production of Urban Space (Austin: University of Texas Press, 1985); H. Lefebvre, The Production of Space (Oxford: Basil Blackwell, 1990); E.W. Soja, "Regions in context: spatiality, periodicity, and the historical geography of the regional question", Environment and Planning D, 1985, 3, p. 176.

⁸ D. Gregory, "Suspended animation: the stasis of diffusion theory" in D. Gregory and J. Urry (eds.), Social Relations and Spatial Structures (London: Macmillan, 1985), pp. 296-336; E.W. Soja, Postmodern Geographies: the Reassertion of Space in Critical Social Theory (London: Verso, 1989); J. Urry, "Localities, regions and social class", International Journal of Urban and Regional Research, 1981, 5, pp. 455-474 and "Society, space and locality", Environment and Planning D, 1987, 5, pp. 435-444.

⁹ T.J. Barnes, "Place, space and theories of economic value: contextualism and essentialism in economic geography", Transactions. Institute of British Geographers, N.S., 1989, 14, pp. 299-316; J. Graham, "Theory and essentialism in Marxist geography", Antipode, 1990, 22, pp. 53-60; S.A. Resnick and R.D. Wolff, Knowledge and Class: a Marxian Critique of Political Economy (Chicago: The University of Chicago Press, 1987); M. Storper, "The post-Enlightenment challenge to marxist urban studies", Environment and Planning D, 1987, 5, pp. 418-426.

contradictions.

A critical question which stems from this interpretation is, how do economy, society and space interact? In contrast to traditional positions, some writers have argued that society is not simply a consequence of the productive forces of capitalist relations, the exchange functions of a market economy, nor the result of subjective human actions, but has a degree of autonomy which is separate from and interactive with capitalism.¹⁰ Different phenomena are not simply instances of the capitalist drive to accumulation but operate in tandem with accumulation. These new strands of social thought have infiltrated historical geography in the form of humanist Marxism and humanism, especially in the cultural sphere.¹¹ This stands in contrast to the strand of historical geography following Darby's 'pragmatic' empiricism where the concern has been with the spatial expression of social processes. Structures are "multi-dimensional": like a thick piece of thread they are composed of various strands, each individual yet dependent on and determined by the others.¹² Thus, urbanization is not to be 'read off' from the imperatives of capitalism. The city is the place where the separate strands - the workplace, home, political institutions, land - are woven into a particular tapestry. Every piece is structured by the possibilities and constraints of the loom yet distinct in its pattern and meaning. Linked to this is

¹⁰ Storper, "The post-Enlightenment challenge".

¹¹ R.A. Butlin, "Theory and methodology in historical geography" in M. Pacione (ed.), Historical Geography: Progress and Prospect (London: Croom Helm, 1987), pp. 27-35; Dennis, "History, geography, and historical geography", pp. 267-274.

¹² Gregory, "Suspended animation", p. 328.

the reformulation of the relationship between space and the economy.¹³ In the urban context this relationship has traditionally been viewed either within the framework of marxist rent theory or the neo-classical bid-rent curve. Both the theoretical and methodological leanings of these perspectives have relegated space and the human actions underlying the formation of place to a subsidiary position within the wider context of political economy, whereas recent formulations have reconstituted the production of space as a critical feature linking and underpinning industrialization and urbanization. Here space is a central element of social theory, not reducible to 'functions for capitalism'.

Post-structuralist ideas have filtered down into historical geography, especially through the writings of a number of scholars at Cambridge in the late 1970s and early 1980s.¹⁴ These writers have attempted to construct a new theoretical agenda for historical geography based on the writings of Marx and Giddens. Three themes are evident. The first deals with the dual character of social existence; the individual and collectivities. There is a recursive relationship between agency and structure which forces one to take careful consideration of the historical context and the actors who consciously and, often, unwittingly create structures and are subservient to them. A second theme relates to bringing back social dynamics to the study of history.

¹³ M. Ball, "The built environment and the urban question", Environment and Planning D, 1986, 4, pp. 447-464; K. Cox and A. Mair, "Locality and community in the politics of local economic development", Annals of the Association of American Geographers, 1988, 78, pp. 307-325; H. Leitner and E. Sheppard, "The city as a locus of production" in R. Peet and N. Thrift (eds.), New Models in Geography (London: Unwin Hyman, 1989), vol. 2, pp. 55-83; J.R. Logan and H.L. Molotch, Urban Fortunes: the Political Economy of Place (Berkeley: University of California Press, 1987).

¹⁴ See their articles in Baker and Billinge (eds.), Period and Place.

Traditional approaches in historical geography have concentrated upon static representations of spatial patterns rather than the fluid and dynamic relationships between spatial and social relations. According to Baker, historical geography must first and foremost be about people as it is they who create the material world which the spatial reflects.¹⁵ A third theme relates to the specific objects that historical geographers concern themselves with. It is argued, for example, that the formation of class and class consciousness needs to be studied within the context of specific situations (i.e. recreate the class character of particular places), seen as products of cultural and social dimensions as well as economic ones.

Historical geography and intra-urban industrial geography

It is no coincidence that the restructuring of social theory has appeared at the same time as rapid and massive changes are taking place in the world economy. These changes highlight, once again, the inherent instability of capitalism and its susceptibility to radical change. Weberian, neo-classical, systems, and behavioural theories have been criticized as inadequate to describe and explain the course of contemporary economic change. A flurry of new concepts and theories has been introduced into geography in order to shed light on the geographical ramifications of these global changes. Among them are the new international division of labour, spatial divisions of labour, long waves, and flexible accumulation. Although the main

¹⁵ Baker, "On ideology and historical geography" in Baker and Billinge (eds.), Period and Place, pp. 233-243.

task of these theories has been to chart the changes taking place within industries, especially sectors with a high-tech component or dominated by transnational corporations, there has been little concern with how these changes impinge upon the material world of communities. An alternative to this is locality research, which I examine in greater detail in Chapter 3.4, where an attempt is made to understand the recursive relationship between process and place through detailed studies of individual areas.¹⁶

Interest in the intrametropolitan location of industry has taken a back seat to regional and international changes. With the exception of some of Allen Scott's work, there have been no recent attempts at a theoretical exegesis of the dynamics of industrial geography within the city.¹⁷ The historical context of urban industrial geography is still dominated by Weberian notions of transportation cost minimization in an equilibrium framework or by determinist visions of technological change.¹⁸ The industrial geography of cities is a field in which we urgently need to explore the relationships between space and process. While the classical approaches to urban industrial location have been roundly criticized, recent theories have concentrated

¹⁶ P. Cooke (ed.), Localities: the Changing Face of Urban Britain (London: Hyman Unwin, 1989); Lancaster Regionalism Group, Localities, Class and Gender (London: Pion, 1985).

¹⁷ An exception is H. Leitner and E. Sheppard who recently published an article that offers a political economy approach to location in the city. See "The city as a locus of production".

¹⁸ There are exceptions to this. See D. Hiebert, "Discontinuity and the emergence of flexible production: garment production in Toronto, 1901-1931", Economic Geography, 1990, 3, pp. 229-253 and E.K. Muller and P.A. Groves, "The emergence of industrial districts in mid-nineteenth century Baltimore", Geographical Review, 1979, 69, pp. 159-178.

upon industries rather than upon particular cities.¹⁹ The scale of interest has been at the wider region, and the historical context has been neglected. Many of the studies that have attempted to place a historical and urban framework on social theory have done so at the expense of empirical questions. At the same time, the production of industrial space has been separated from wider causal powers. In particular, the interaction between economic imperatives and the social construction of the built environment are missing. Even where the built environment is considered, it is as an uncontested outcome of capitalist development. This is unfortunate as the impoverished condition of the historical context of intra-metropolitan location urgently needs to be replenished by the new directions that social theory has taken in contemporary urban and industrial research, and social and labour history.

Reflective of the lack of importance attached to the historical dynamics of urban industrial geography is the lack of attention paid to the subject in geographic journals. A study of the content of the Journal of Historical Geography showed that only eight of the 174 articles published between 1975 and the mid 1980s were directly concerned with industrial change since the end of the eighteenth century.²⁰ Even when historical geographers are explicitly concerned with industrial change, it is

¹⁹ Again there are exceptions to this. See the collection of papers in M.P. Smith and J.R. Feagin, The Capitalist City: Global Restructuring and Community Politics (Oxford: Basil Blackwell, 1987) and Cooke (ed.), Localities.

²⁰ C.G. Pooley, "The historical geography of industrial change" in Pacione (ed.), Historical Geography, p. 158. Pooley also refers to the fact that geographers have made few contributions to economic history journals.

usually couched within cultural considerations and draws heavily on structuration theory. The latter perspective, despite claims to the constitutional duality of agency and structure, has led most researchers to understand the social and cultural components of society.²¹ As Dennis and Prince state in their recent overview of British urban historical geography, "[y]et for all the interest in the *social* geography of cities, there has been little work on their *economic* geography".²² This is also true for North America. Because little work has been done upon industrial change by historical geographers, the current understanding of the historical development of the industrial geography of the North American city is still rooted in Weberian notions of industrial location. While Richard Dennis, in a recent review of historical geography, can state that "British historical geographers have shown less interest in the location of industry" than their North American colleagues, the latter, in fact, have done very little work on the spatial implications of the radical changes in industrial structure after 1850 that historians have identified.²³ And when they have it is a broad scale; generalizations abound without substantial, if any, empirical research.²⁴

²¹ The most promiscuous example of the use of structuration theory in industrial geography is D. Gregory Regional Transformation and Industrial Revolution: a Geography of the Yorkshire Woollen Industry (London: Macmillan, 1982).

²² R. Dennis and H. Prince, "Research in British urban historical geography" in D. Denecke and G. Shaw (eds.), Urban Historical Geography: Recent Progress in Britain and Germany (Cambridge: Cambridge University Press, 1988), p.18. The neglect of industry is exemplified by M. Billinge who writing of British urban historical geography only discusses social geography. See "Reconstructing societies in the past: the collective biography of local communities" in Baker and Billinge (eds.), Period and Place, pp. 19-32.

²³ Dennis, "History, geography, and historical geography".

²⁴ For example, Walker's discussion of suburbanization in the United States makes a number of assertions about the industrial structure of the nineteenth and twentieth-century city. There is, however, no original research and he makes broad generalizations based on simplifying secondary literature, which

Historical geography, industry and history

In the last couple of decades historians have made a concerted effort to widen our vision of the historical development of North American industry and urban society. New themes and methodologies emanating from history question our understanding of the historical development of North American urban industrial location. Historians interested in industrial evolution and labour history have escaped from technologically-based understanding of industrial change on the one hand, and on the other, the strait-jacket of institutional and union history to explore the intricate workings of the labour process and technological change, the changing role of women in the workforce, and the different dimensions of the family and industrial change.²⁵ Linking a multitude of sources such as credit ledgers, the census, and assessment rolls, historians have constructed detailed histories of industries and firms, with particular emphasis upon working life and conditions. Since the 1960s in the United States, social and labour historians have initiated a perspective which fundamentally differs from the prevailing institutional history, while a similar research agenda dates from the early 1970s in Canada. In Canada, for example, labour historians began to look at issues such as class, working-class life, local communities and the early stages of the Industrial Revolution. In the last ten years, English-Canadian labour historians have become preoccupied with a new set of themes, namely the labour process, the position of ethnicity within working-class life,

itself is based on a great deal of simplification. See "A theory of suburbanization".

²⁵ For a review of these new paths see the "Introduction" to B. Laurie, Artisans into Workers: Labor in Nineteenth-Century America (New York: Noonday Press, 1989).

and women and history.²⁶ An excellent example of the way that the 'new' historians have transformed our understanding of historical change is through a reorientation of the questions posed about the role of the railway industry in North American life. Formerly, the principal preoccupation of historians was with the importance of the railroad to North American economic growth, and with the political machinations of the industry. Recent work, however, is now exploring railway shops as places of work.²⁷ In summary, the new social and labour history has given rise to a body of work which has provided a number of important leads for a re-interpretation of the historical evolution of capitalism.

While historians have explored a number of threads of society, they have put little effort into understanding the spatial basis of history. While a major interest of historians has been the reorganization of the labour process, for example, they have paid little attention, at least explicitly, to the spatial character of industry or the relationship between home and work. For most, the spatial connections between phenomena such as new industrial districts, the separation of home and work, and the expansion of the central business district are insignificant, and not worthy of study. In other words, for historians, the dynamics of industrial change are played out on a featureless plain. There are, of course, exceptions to this: S. Buder's discussion

²⁶ J. Burgess, "Exploring the limited identities of Canadian labour: recent trends in English-Canada and in Quebec", International Journal of Canadian Studies, 1990, 1-2, pp. 149-173.

²⁷ Two recent studies are for the, United States, W. Licht, Working for the Railroad: the Organization of Work in the Nineteenth Century (Princeton: Princeton University Press, 1983) and, for Canada, P. Craven and T. Traves, "Canadian railways as manufacturers, 1850-1880", Canadian Historical Association, Historical Papers, 1983, pp. 254-281.

of the creation of a new productive space at Pullman, south of Chicago is an excellent example of how the social relations of production are associated with the development of space.²⁸

The fact that few historians have concerned themselves with the spatial implications of their subject is, of course, no surprise. What is surprising is that few historical geographers have taken up the challenges presented by these new directions in social and labour history. One would expect an active cross-fertilization of theory and method between the new history and the historical geography of industry, but, as I mentioned above, there has been little reformulation of the historical aspects of industrial processes within historical geography. In view of this lacuna, there are exciting possibilities for a reinterpretation of the relationship between urban and industrial structures after 1850. It is possible to identify three challenges at the intersections of history and geography that need to be answered if a more multi-dimensional picture of the historical geography of North American industrial urban change is to be formulated.

The first challenge is to explore the geographic changes associated with the uneven development of new industrial technology, of the labour process and of the organization of production. Studies of technological changes to industry have explored the broad outline of the transformation from proprietary firm to corporation, while others have examined the impact of new technologies upon

²⁸ Pullman: an Experiment in Industrial Order and Community Planning, 1880-1930 (New York: Oxford University Press, 1967).

selected industries.²⁹ It has been pointed out that broad bursts of technological change in particular industries were associated with large capital investments, changes to the labour process, the capturing of new markets, and new forms of labour control. The implementation of new technologies was fraught with difficulties however: the integration of technology into production in the nineteenth and early twentieth century was severely limited by a series of obstacles. Likewise, historians of the labour process have noted that a simple technological explanation is inadequate to explain its transformation.³⁰ The development of specialized divisions of labour in a number of trades preceded the introduction of new technologies, while other factors shaping the labour process were the extent of the market, the material base of products, and workers' control over segments of the production process. Similarly, writers have pointed to the various forms that the organization of production could take. Scholars have shown that the classic model of the social organization of production which portrays a monotonic progression from the small handicraft shop of the shoemaker, tailor and blacksmith to the large corporation such as Ames and Holden, Dominion Textile and Stelco with a number of plants, a large labour force and international markets, is only one trajectory of industrial change.

²⁹ A.D. Chandler, The Visible Hand (Cambridge: Belknap Press, 1977) and Scale and Scope: the Dynamics of Industrial Capitalism (Cambridge: Belknap Press, 1990); C. Heron, Working in Steel: the Early Years in Canada, 1883-1935 (Toronto: McClelland and Stewart, 1988); D. Nelson, American Rubber Workers and Organized Labor, 1900-1941 (Princeton: Princeton University Press, 1988); P. Scranton, Proprietary Capitalism: the Textile Manufacture at Philadelphia, 1800-1885 (New York: Cambridge University Press, 1983).

³⁰ J. Burgess, "L'industrie de la chaussure à Montréal: 1840-1870 -- le passage de l'artisanat à la fabrique", Revue d'histoire de l'Amérique Française, 1977, 31, pp. 187-210; P. Scranton, "The workplace, technology, and theory in American labor history", International Labor and Working-Class History, 1989, 35, pp. 3-22.

The paths of change were varied within and between industries as firms grappled with the problems of distribution, and the implementation of technologies and new work practices.

A second challenge is to interpret the formation of urban industrial spaces within the context of the cyclical growth of capital investment. The sudden bursts, and just as sudden drying up, of capital investment associated with cycles of different length have important implications for the restructuring of urban industrial geography. Since the 1970s the geographic literature has covered the cyclical nature of capital in various ways. The theoretical work of Massey on the relationship between spatial divisions of labour and rounds of investment has triggered a great deal of discussion, if little empirical research.³¹ The relationship of industrial depression and investment in the built environment has been a critical contribution of David Harvey over the years.³² Empirical observations confirm the cyclical character of industrial and urban growth and relate the tempo of urban growth to the movement of capital through the international economy³³, and the impact of the building cycle to the residential structure of cities.³⁴ Geographers have also made

³¹ D. Massey, Spatial Divisions of Labour: Social Structures and the Geography of Production (London: McMillan, 1984).

³² D. Harvey, "The urban process under capitalism: a framework for analysis" in Dear and Scott (eds.), Urbanization and Urban Planning, pp. 91-121.

³³ S. Olson, "Baltimore imitates the spider", Annals of the Association of American Geographers, 1979, 69, pp. 557-574.

³⁴ For Montreal such studies include D. B. Hanna, "Montreal, a city built by small builders, 1867-1880", (Ph.D. thesis, McGill University, 1986); G.J. Levine, "Class, ethnicity, and property transfers in Montreal, 1907-1909", Journal of Historical Geography, 1988, 14, 360-380.

contributions to an understanding of the geography of the longer waves - the long wave or Kondratieff cycle - of fifty years. This has generally been geared to the discussion of the industrial restructuring associated with the introduction of major technological innovations, the development of new class relations, and the creation of new urban forms.³⁵ While the literature on economic cycles has proven to be a useful entry to comprehending the broad lineaments of the timing of industrial and urban changes, and a device with which to undertake more detailed analyses of the ups and downs of the building of the urban fabric, it has rarely been used to examine the making of industrial space. An important concern of this thesis is to make links between long waves of growth and the specificities of place through the ideas presented in locality research.

A third challenge is to specify more fully the active creation of urban industrial spaces. An important line of research has been, through local case studies, to demonstrate the importance of land developers in the building of certain socially segregated neighbourhoods and suburbs.³⁶ For Montreal for example, Paul-André Linteau's study of the suburb of Maisonneuve looks at the flow of French-Canadian capital into the making of a working-class, industrial district.³⁷ Allied with this are the studies which look more closely at the dynamics behind the development of class,

³⁵ Soja et al., "Urban restructuring"; Walker, "The transformation of urban structure" and "A theory of suburbanization".

³⁶ The classical treatment of this topic is S.B. Warner, Streetcar Suburbs: the Process of Growth in Boston, 1870-1900 (Cambridge: Harvard University Press, 1978).

³⁷ The Promoters' City. Building the Industrial Town of Maisonneuve, 1883-1918 (Toronto: Lorimer, 1985).

ethnic and occupationally based residential segregation.³⁸ A second line of research is the examination of the function of finance capital in the development of central business districts as a new landscape.³⁹ Lastly, writers have related urban growth to the actions of local elites in harnessing their search for profits to the apparatus of the state.⁴⁰ This boosterism literature, however, has had little to say about the importance of local growth machines for the creation of urban industrial spaces, and few writers have attempted to specify the processes responsible for the creation of new and the modification of old districts with chunks of industrial capital.

1.3 Methodology and Outline of Thesis

Theory and method in historical geography

I have suggested that recent formulations of social theory and new directions in history have generated a series of questions that challenge the conventional

³⁸ S. Greenberg, "Industrial location and ethnic residential patterns in an industrializing city: Philadelphia, 1880" in T. Hershberg (ed.), Philadelphia: Work, Space, Family and Group Experience (New York: Oxford University Press, 1981), pp. 204-229; Y. Schreuder, "Labor segmentation, ethnic division of labor, and residential segregation in American cities in the early twentieth century", Professional Geographer, 1989, 41, pp. 131-142; Zunz, The Changing Face of Inequality.

³⁹ Some important studies are G. Gad and D. Holdsworth, "Corporate capitalism and the emergence of the high-rise office building", Urban Geography, 1987, 8, pp. 212-231; Mona Domosh, "The symbolism of the skyscraper: case studies of New York's first tall buildings", Journal of Urban History, 1988, 14, 3, pp. 321-345 and "Shaping the commercial city: retail districts in nineteenth-century New York and Boston", Annals of the Association of American Geographers, 1990, 80, 2, pp. 268-284; D. Ward "The industrial revolution and the emergence of Boston's central business district", Economic Geography, 1966, 42, pp. 152-171.

⁴⁰ C. Abbott, Boosters and Businessmen: Popular Economic Thought and Urban Growth in the Antebellum Middle West (Westport: Greenwood Press, 1981); A.F.J. Artibise, "Boosterism and the Development of Prairie Cities, 1871-1931" in G.A. Stelter and A.F.J. Artibise (eds.), Shaping the Canadian Landscape: Aspects of the Canadian City-Building Process (Ottawa: Carleton University Press, 1982), pp. 116-147.

understanding of North American historical urban industrial geography. The two sets of 'understandings' of the evolution of urban industrial geography that were mentioned above - the location of industry, and the relationship between the cyclical dynamics of industrial change and urban development - are just two examples of the way that historical geographers have set up obstacles to the elucidation of the formation of urban industrial space. These barriers are a consequence of the past theoretical and methodological concerns of historical geographers.

The art of historical geography, it could be argued, lies in its blending of concepts of space, place, and landscape with the structural constraints constructed by human beings over time. Whether we capture the actions of the past frozen through slices distilled from sources such as census manuscripts and assessment rolls, or more actively through narratives explaining the course of events, we bear allegiance to describing, analysing, and explaining the relationship between human actions, structures and the landscapes of the past. Historical geographers, perhaps more than other human geographers, are committed, through their attention to the analysis of past events, to the historical form of discourse, narrative. In the past, narrative and its close relation, empirical research, have been the predominant modes with which historical geographers have practiced their craft. Narrative, although rich in context, has been divorced from theory and this has led us down many a cul-de-sac: simple descriptions of urban and rural landscapes; the identification of the distribution of phenomena; and the charting of events. The strongest tradition in historical geography, as one writer has stated, is one in which

there is "a strong commitment to historical study of landscapes and to the mapping of historical data sources, with occasional ventures into the reconstructions of regional geographies of the past."⁴¹ These concerns have been buttressed by a pragmatic scholarship, where methodology was determined by the sources available and the type of problem under consideration. In other words, there was little theory or else theory was shaped by the sources; the historical narrative being backed up by the results of rigorous empirical research. Years of research spent in the archives or in the field being used to support the claims of the story.

What has been missing, until recently, from the duet of narrative and empirical research in historical geography is theory, and its close relation, process.⁴² In this thesis I understand a social theory to be a set of concepts which is used to make sense of and as a means of entry into the multi-faceted dimensions of social life. By process I mean that

[a]ll entities in society change as the direct consequence of the complex contradictions that constitute their existence. To exist at all ... is to be overdetermined, contradictory, changing, and hence in a state of process. Entities ... become processes.⁴³

Using process as theory, however, can be dangerous as it leads to a situation where "processes are identified that impose themselves on history, specifying a course of

⁴¹ Butlin, "Theory and methodology", p. 21.

⁴² A.R.H. Baker, "On ideology and historical geography" in Baker and Billinge (eds.), Period and Place, pp. 233-243; Butlin, "Theory and methodology", pp. 16-45; R. Dennis, "People and housing in industrial society" in Pacione (ed.), Historical Geography, pp. 184-216; Pooley, "The historical geography of industrial change", pp. 161-162.

⁴³ This paragraph draws heavily upon chap. 1 of Resnick and Wolff, Knowledge and Class. The quote is from p. 7.

development before history unfolds".⁴⁴ Certain conceptualizations of processes, for example, those which portray social change as determined in the last instance by the economic, become the sole criterion, the fundamental cause, or the essential explanation of truth. This essentialist approach to understanding the historical geography of capitalism needs to be replaced by a position where no one process determines the social totality more than any other. In other words, the economic is no more responsible for the tangled web of social existence than is the social or the cultural. To take this one step further: it is not possible to construct a theoretical position that purports to capture all dimensions of multi-faceted reality. At any one point in time, processes are overdetermined - or constituted of all other processes occurring at that time. In order for this notion of theory and process to be integrated into historical geography, great care must be taken not to assume the position where reliance on an essentialist conception forces us into laying out a denuded picture of historical landscapes.

The concern of Chapters Two to Four is a discussion of the relevant literature and the development of ideas about production and space underpinning the empirical research of the industrial geography of Montreal. The purpose of Chapter Two is to briefly outline the development of perspectives which have attempted to decipher the logic of nineteenth and early twentieth-century intra-urban industrial location. Although the understanding of location within the city has taken many twists and turns, it is possible to point to two main perspectives - the positions

⁴⁴ Graham, "Theory and essentialism", p. 56.

emanating from Weber's least-cost and Scott's transactional theories - in which the nineteenth and early twentieth industrial structure of North American cities has been formulated. Chapter Two discusses these in some detail, drawing out their major lineaments, strengths and weaknesses, and sets the stage for the theoretical forays of the following two chapters.

One of the major weaknesses, I argue, of previous formulations of intra-urban industrial location theory is their inability to conceptualize the locational choices of firms within the contexts of the various productive strategies open to firms, and the making of industrial space. I have suggested above that the social relations of space and the form these relations take are the result of all processes occurring at any one time. Aligned with this is the idea that there are many versions of the truth, none of which is more real than the others. In order to distill some semblance of 'order' from the infinite multitude of processes acting to form human society and space, it is necessary to harness the concept of "entry point". An entry point is a conceptual tool which allows us to make particular cuts into the multi-dimensionality of social life. It is the "particular concept a theory uses to enter into its formulation, its particular construction of the entities and relations that comprise the social totality".⁴⁵ Each theory has its own distinct entry point - this being one of the primary distinguishing features of theories. For example, the entry point of neo-classical economics is the individual firm seeking to maximize profits within the context of perfect competition. The way that entry points are utilized here is that they "cannot serve as an essence,

⁴⁵ Resnick and Wolff, Knowledge and Class, p. 25.

a referent whose nature is somehow independent of the other discursive terms that, in fact, give it life".⁴⁶ The utilization of entry points is a way to include both social and the spatial relations into a particular understanding of reality.

In order to grasp the construction of the urban industrial landscape, two entry points are formulated in this thesis. The first, and the focus of Chapter Three, is the notion of production format. Formats make up a conceptual framework which recognizes that firms and industrial sectors demonstrate a wide variety of relationships to technology, the labour process, and the social organization of production. I have devised this framework in order to highlight the diversity of productive strategies available to manufacturers, which in turn establishes a large number of locational possibilities within the city.

The second entry point and the concern of Chapter Four, is that of industrial space. I use the term to encompass much more than the 'production space' of a factory floor, a furnace room, or a shipyard, and my objective is to penetrate the social and industrial dynamics behind the construction of industrial districts. By industrial space I mean two things: first, the material fabric of place which is comprised not only of manufacturing establishments but also the whole host of reproductive institutions such as homes, schools, churches, shops and taverns; and second, the social and economic relations existing within, as well as the dynamics that give rise to, the built environment that constitutes the physical form of industrial

⁴⁶ Resnick and Wolff, Knowledge and Class, p. 29.

spaces.⁴⁷ In this thesis the dynamics are identified as industrial organization, waves of growth, and local political alliances. The spatial implications of the dynamics underlying these changes are discussed with regard to the making of industrial space.

As theory construction and empirical research involve making judgements about what to include and what not to include, this thesis contains some theoretical and empirical omissions. The intent of the study is to provide a description of the industrial geography of one city through biographies of firms, industries and industrial districts, and to explain how industrial organization, cycles of growth, and the making of the built form contributed to this geography. Three important omissions stand out. I do not provide any new theoretical angles on or undertake original research upon the construction of the built environment; the complex set of connections between manufacturing and finance; and the role of labour in the making of industrial space. These are significant gaps, but the scope of the thesis is, I believe, large enough without performing the type of research necessary to present further illustrations of these questions. Thus such considerations as information on the development of Montreal's social and physical infrastructures, the role of capital markets in the creation of industrial districts, and the activities of labour within and outside the workplace are touched upon lightly, and are obtained from the substantial work already done by other scholars.

⁴⁷ Although reproductive institutions are not the concern of this thesis, this should not be taken to mean that I believe that reproduction should be subsumed into production.

Case studies and method

Following the theoretical discussion of production formats and industrial space, an empirical analysis of Montreal's industrial geography is presented. Chapters Five to Six are comprised of case studies which illustrate the theoretical claims made about productive formats and industrial spaces. My assertion in Chapter Three of the variety of industrial production formats, and my argument in Chapter Four on the social construction of industrial districts call for illustration through a series of case studies at various scales and refinement. Chapters Five and Six are concerned with elucidating the industrial geography of Montreal between the 1840s and 1881 and between 1871 and 1918 respectively.

The case study approach that I take in this thesis is concerned with making two types of statements. The first has to do with providing broad empirical generalizations at the urban level through the generation of a data set comprised of annual rents for all manufacturing establishments in Montreal in selected years. While this type of empirical research provides a description and the patterns of urban industrial geography, it cannot explain why and how that geography exists. The second set of statements comes from making cuts into Montreal's industrial geography through detailed case studies of districts, industries and firms. This type of "intensive" research is an attempt to complement the limitations of the broad generalizations gained from "extensive" research.⁴⁸ The case studies of districts and

⁴⁸ See R.A. Sayer, Method in Social Science: a Realist Approach (London: Hutchinson, 1984), chap. 9.

industries provide insights into the actual mechanisms identified by the theoretical observations and highlight how, in given situations, particular combinations of events produced specific outcomes in space.

Despite my earlier criticism of the 'snapshot' method, I have in fact constructed snapshots of the city's manufacturing structure in 1861 and 1890.⁴⁹ This immediately raises two questions: why cross-sections and why these dates? The cross-sections enable us to make descriptions of the location of industry at a particular point in time and comparisons over time; but they do not allow us to make an interpretation of the dynamics underlying the patterns. To examine the processes and broader changes that generate the static representations of Montreal's industrial geography in 1861 and 1890, I adopt selected industries and industrial districts for case studies: intensive biographies of the tobacco, clothing, cotton, metal, baking and printing industries, and in-depth study of the districts of the Lachine Canal and Saint-Henri.

The dating of the two snapshots was dictated by the questions that I established earlier in the chapter, and by the logic imposed by my understanding of the economic and social growth of Montreal. To grapple with these points and to provide an entry into the industrial history of Montreal, it was necessary to make slices of the city's development. Scholars have created a number of periodizations of

⁴⁹ The data source for these snapshots is the City of Montreal's rôle d'évaluation. A discussion of the rolls will be undertaken in the following section (1.4).

Canadian and Quebec history.⁵⁰ For the purpose of examining the evolving industrial geography of Montreal, I identify three periods: one running from the late 1840s to the 1870s, another from the 1870s to the 1890s, and the last from 1890s to 1918. The periods are related to broad economic and social trends associated with the long wave of fifty years, a phenomenon that I discuss in detail in Chapter 3.3. The long wave running from the 1840s to the 1890s, consisting of the first two periods, was associated with the wide-spread diffusion of the steam engine and machine-made machines, the realignment of class and state relations, and the widening of international markets. In Montreal in this period, there was a rapid transition from handicraft production to 'modern' industry, the dismantling of colonial economic relations, and increasing state control. The third period, from the 1890s to 1918, was bound up with the expansion phase of the 'Second Industrial Revolution': the development of corporate capitalism, the diffusion of electric power, the segmentation of the labour force. By 1918, the industrial structure of Montreal was firmly in place, large corporations controlled many industries, and new waves of immigrants were arriving.

It was with these phases of Montreal's growth in mind that I choose to collect data on the manufacturing establishments for 1861 and 1890. The first date captures the burst of industrial growth of the 1850s, and shows the spatial organization of the initial movement to a modern industrial urban complex. The choice of 1890 enables

⁵⁰ For a discussion of the periodizations see J.A. Dickinson and B. Young, "Periodization in Quebec history: a reevaluation", *Québec Studies*, 1991, No. 12, pp. 1-10. The periods I establish in this thesis are very similar to what Dickinson and Young advocate.

the showing of the state of the city's industrial geography at the point between the demise of the long wave that began in the 1840s and the arrival of the next one. It captures industry before the deep recession of 1893-1897 and the following massive degree of capital investment that came with the 'Second Industrial Revolution'. By 1890, we should be able to identify the productive spaces associated with the 'First Industrial Revolution' in Montreal.

The issue of scale •

The problem of the geographical context in which this thesis is situated has been resolved by providing a series of spatial scales. The question of scale has always bedevilled geographers: the choice of the spatial scales amenable to describing and explaining the location of industry within the city is a vexing one. I have suggested above that the way that historical geographers have grappled with this question has had an enormous impact upon the generation of theory and methodology in historical geography. Although I do not propose to provide any theoretical solutions to this problem, I do attempt to examine the historical development of urban industrial geography through a range of scales. As I mentioned above, the decision to undertake a study of urban industrial geography based on broad spatial limits is fraught with dangers: the reliance upon ward or other administrative boundaries can, and often does, hide more than it reveals. This is especially true in the case of industrial suburbs which exist next to, are administratively separate from, but are dependent upon the central city. In order to avoid this problem in the analysis it was

necessary to construct a number of other spatial levels. For a study of this sort two critical scale issues arise: those of geography and industry.

The smallest geographic scale is made up of spatially separate districts which are distinguished from each other by their industrial organization, their timing of development, and the manner in which the built environment was constructed. These districts are built up from data for individual firms which are assigned to cells making up a grid that was placed over a map of the city.⁵¹ Once the industrial content of each cell was known, the cells then were allocated to a particular district based on the three factors mentioned above: there were eight districts in 1861 and ten in 1890. The number of cells making up a district ranged from one in Griffintown to nine in the districts of Maisonneuve and the North End, and the number of firms in a cell ranged from zero in both years to 203 in 1861 and 304 in 1890.⁵²

In order to make broader statements about the geography of Montreal's industry, I collapsed districts that had similar industrial properties and were spatially contiguous into 'zones'. Five zones were created: the first was made up of only the district of Old Montreal; the second, known as the outer core, consisted of Saint-Antoine, Saint-Lawrence and Saint-Jacques districts; the third which was made up of Lachine, Griffintown and Saint-Henri, I called the west end; the fourth, the east end, was built up from Sainte-Marie and Maisonneuve; and the last, the North End, was composed of the Plateau.

⁵¹ The map is the Ville de Montréal, Service de l'Urbanisme, Utilisation du Sol, 1983 at 1:1,000. Each cell covers 1,332 square metres.

⁵² See Appendix 1 for a detailed breakdown of the 1861 and 1890 manufacturing data.

The largest scale at which analysis is undertaken is that of the urban district of Montreal, which I define as the municipal corporation and its contiguous urban territory at the end of the study period. This of course is questionable: why stop at the city and its surrounding areas when Montreal's economic reach extended far beyond these boundaries? One response is that between 1850 and 1918 a large proportion of Quebec's industry was located in the municipality of Montreal. Another is that a great deal of rural industry in this period was moving into Canadian cities - mainly Montreal - or was being made redundant by the forces of industrial capitalism underway in the metropolis.⁵³ A third reason is that the interest of the thesis is the development of industrial spaces - the changing morphology - of urban centres. Lastly, source restrictions - mainly the difficulty of finding assessment data and documents relating to firms to match that existing for Montreal - compelled me, along with the restrictions of time, to make certain choices about the area to be covered.

A similar approach has been taken with regard to industry. As the definition of what constitutes an industry is one laden with conceptual baggage⁵⁴, I define industry through a number of different scales. I shall deal with industrial sectors such as textiles (made up of, among other things, cotton, blankets, and silk) and metals (primary metal, metal fabrication, and machinery) as one entry into the larger-scale

⁵³ J. Willis, The Process of Hydraulic Industrialization on the Lachine Canal: Origins, Rise and Fall (Ottawa: Environment Canada, 1987).

⁵⁴ R. Walker, "Technological determination and determinism: industrial growth and location" in M. Castells (ed.), High Technology, Space and Society (Beverly Hills: Sage, 1985), pp. 228-231.

movements of industrial capital over time. This, of course, follows the normal census Standard Industrial Classification system which usually classifies firms by their relationship to the material requirements of firms. This is not always such a successful system, and can cause a great deal of confusion.⁵⁵ A subset of sectors are industries which I define as a set of firms which are more closely related than those making up a sector because of their specific array of technologies, labour processes, supply and demand markets, and inter-firm linkages. To grasp the varied productive strategies undertaken by individual industries such as machinery, baking, cotton, tobacco, and boot and shoe, it was necessary to make a more elaborate classification of manufacturing firms. Through examination of individual industries, and in some cases, individual firms and branches, it is possible to delve deeper into manufacturing dynamics. A third way of analysing firms is through their scale of capital. Scale of enterprise rests primarily upon the amount and ratio of variable and fixed capital; for a city the size of Montreal there is a wide range of capital investment by firm. My intent in this study is not to define firms by the traditional dichotomy of small and large firms, but to take a flexible approach which highlights the diversity of investment by firm and industry.

Throughout Chapters Five and Six there is an attempt to connect broader processes with everyday reproduction of industrial relations in an urban context through histories of firms, industries and industrial districts. By specifying the

⁵⁵ See Walker, "Technological determination and determinism". A listing of all Montreal manufacturing firms for 1861 and 1901 by my modified version of the Standard Industrial Classification system can be found in Appendix 2.

linkages between broad notions of uneven development and individual case-histories, we can reconstitute some features of the industrial geography of a city. The focus of the thesis will be on how industrial districts are formed; that is, the dynamics behind the creation of productive spaces.

1.4 Sources

Conventional archival sources and methods are utilised to examine the city's productive formats and productive spaces. An obvious source for the examination of Montreal's industry is the Canadian manufacturing census. Unfortunately this is not possible for the delineation of Montreal's industrial geography.

The first Canadian census which provides an adequate appraisal of Canada's industry is that of 1871. Earlier censuses do not provide a comprehensive description of the city's manufactures. According to William Hutton, the chief census taker, the manufacturing section of the 1851-1852 census was "undefined and so incorrectly stated that little reliable information ... can be gleaned from the Returns". The same problem appears to exist for 1861. In both years there is severe underestimation of manufacturing establishments: according to the census, the number in 1851 was sixty-nine and in 1861 it was 144, yet from the City of Montreal tax rolls I count nearly that many in a single ward, Saint-Ann. By 1871 the census had been reorganized, and the term manufacturing would henceforth "apply to all industries of any importance

conducted in separate establishments or workshops".⁵⁶ For the first time, it is possible, using the census to outline the contours of Montreal's industry. The work of Bradbury, and Bellavance and Gronoff, for example, show how the census can illuminate various aspects of economic, family, and spatial structure.⁵⁷

The census is of limited value for the period after 1871 as well, since the manuscripts of the manufacturing censuses for 1881 and 1891 have been destroyed, and at the time that research was being done, those for 1901, if they still exist, had not been released to the public. While we obtain some of the broad features of Montreal's industrial stock from the published censuses, we cannot extract information with a geographical precision greater than the census district, which was made up of a number of wards. The published census reports of 1881, for example, distribute the city's manufacturing stock among three census districts. This allows us to make few meaningful statements about the internal differentiation of industry in the city.⁵⁸ A further well-known impediment to an effective use of the census is the re-definition in 1901 of a manufacturing establishment: the term initially included all firms, regardless of the number of workers, subsequently only those with at least five

⁵⁶ The discussion of the definition of manufacturing can be found in W. Hutton, "First report", Census of the Canadas, 1851-1852, (Quebec: Lovell, 1853), p. IX; Canada, Census of Canada, 1870-1871 (Ottawa: Taylor, 1875), vol. 3, p. X.

⁵⁷ B. Bradbury, "The family economy and work in an industrializing city: Montreal in the 1870s", Canadian Historical Association, Historical Papers, 1979, pp. 71-96; M. Bellavance and J-D. Gronoff, "Les structures de l'espace montréalais à l'époque de la Confédération", Cahiers de géographie du Québec, 1980, 24, pp. 363-384.

⁵⁸ This of course goes back to the problem that I have mentioned before, the problem of scale. For example, "West" census division contains the firms of Saint-Ann ward and West ward. As we shall see these two wards were markedly different in nearly all aspects of their industrial structure.

employees.

City directories, while useful for cross-reference, do not themselves provide the basis for a systematic examination of industry. The street and alphabetical listings provide no information aside from address and name: no indication of scale or motive power. Nor do they consistently distinguish manufacturing, commercial or residential entries. The "Business Classified Directory", while helpful, is incomplete and biased towards larger firms. An comparison of the listings of a number of industries from the Montreal assessment rolls and Lovells' business directory for 1890 indicates that the latter only contained a small number and the largest of the city's firms.⁵⁹

An exceptional alternative source is the City of Montreal assessment rolls (or the rôle d'évaluation). Collected on an annual basis since 1847, they provide two sets of data. The first set provides for each household in the city, the address, name, occupation, tenure and rent of the head of household. The second provides the corresponding information for each business establishment. For any year beginning in 1847, it is therefore possible to construct a listing of all manufacturing, commercial, and financial enterprises in the city. The firm's annual rent can be used as an estimate for the size of the enterprise, capital value or employment. All businesses were required to pay a seven and a half per cent rate on the rent they

⁵⁹The industries chosen were baking, tobacco, metal-working, and hat making. In all cases there were a great many more firms found in the assessment rolls, while those in the city directory were in the higher rent range. For example, in the baking industry there were fifteen and one hundred and twenty-four firms according to the directory and the assessment rolls respectively, while the median rents were \$446 and \$267.

paid or, if they owned the premises, the market rent equivalent. Despite the obvious biases and discrepancies that creep into any enumeration system, the rents paid by firms provide an excellent picture of the scale of operations.⁶⁰ I have tested this assertion for the year 1871, where the rents from firms in Saint-Ann were compared with the census values for capital invested and number of employees in the same firms. The degree of linear association is 0.95 between rent and capital, and 0.79 between rent and number of employees. Rent is a usable measure of the scale of enterprise.

A major problem of the assessment rolls is the difficulty of differentiating manufacturing firms from retailing and wholesaling establishments. In many cases the rolls do not indicate whether the firm is manufacturing. To solve this problem the strategy employed was to include the ambiguous firms in the initial stage of data collection. They were then cross-referenced with other sources: the annual Lovell's city directory and other business directories. In some cases I was easily able to identify the firm's function. For a large number, however, the distinction between manufacturing and non-manufacturing was blurred because so many nineteenth-century firms performed both functions. The clothing industry was, with few exceptions, under the control of merchant tailors where a small workshop was attached to the store facing the street, and much of the ready-made production took

⁶⁰ For a description of the problems associated with assessment rolls see G.J. Levine, "Criticizing the assessment: views of the property evaluation process in Montreal, 1870 to 1920, and their implications for historical geography", *Canadian Geographer*, 1984, 28, 3, pp. 276-284.

place in homes in the surrounding vicinity.⁶¹ The same was true for baking, saddlery, and jewelry. Even the labels are not trustworthy. The term 'watchmaker', for example, suggests someone in the process of making a watch or clock. In many cases, however, I found that a watchmaker was simply a retailer, who may or may not have had a watch repair shop at the back of the store, and who performed any manufacturing function.⁶² In the case of the boot and shoe industry, it was difficult to differentiate repair shops from full-fledged manufacturers. The same problem existed for firms in other industries such as furniture, pharmaceuticals, and hats and furs.

A related difficulty was with manufacturing firms that had an office or warehouse in Montreal but whose manufacturing operations were located in another city. Only long searches through an assortment of business directories could solve this problem. This problem was compounded by the fact that many of these firms called themselves manufacturers in the listings even though they did not perform any manufacturing activities in Montreal.

Where parts of a firm are spatially separated, the parts would appear in different parts of the rolls because the tax information was organized by lot numbers, street by street. If all the different parts into one establishment were close together such as on a neighbouring block, it was a simple matter to aggregate the parts once

⁶¹ G.L. Teal, "The organization of production and the heterogeneity of the working class: occupation, gender and ethnicity among clothing workers in Quebec", (Ph.D. thesis, McGill University, 1986).

⁶² See W.A. Wood, The Days of John Wood, Watchmaker (Hudson: Wood Family Archives, 1986) for the letters of John Wood, a Montreal watchmaker, from the 1840s to the 1870s.

the data collected in the initial stage had been sorted. When the different parts were at some distance from one another, I assigned the value to the major production site or to the site with the highest rent. When a firm had two different plants in the city (a rare occurrence), I retained the separate locations since the objective at this stage of the research was to map the spatial distribution of industrial production rather than a concern with individual enterprises.

The systematic exposition of Montreal's industrial geography at these two dates will be fleshed out with a discussion of various firms, industries and industrial districts throughout the period. Various extant sources - city directories, industrial journals, booster pamphlets, newspapers, and histories - make it possible to construct biographies of selected firms, industries and industrial districts. These biographies enable us to portray a more 'living' picture of the changing industrial contours of the city, and they illuminate the fundamental geographic processes with which I am concerned.

CHAPTER 2 PERSPECTIVES ON URBAN INDUSTRIAL GEOGRAPHY, 1850-1918

2.1 Introduction: Centralization and Decentralization in Industrial Geography

Recognizing the importance of spatially and geographically unique outcomes of more general underlying processes, the aim of theoretical and conceptual development is to provide a framework through which to undertake empirical analysis of specific situations, rather than to generate universally applicable, formal models.¹

In the last two decades a primary concern of economic geographers has been with the political economy of regional change. In the 1970s a major interest of economic geography was the industrial development of the Sunbelt and the deindustrialization of the Snowbelt.² In the 1980s the restructuring of industry became the primary conceptual form for understanding industrial and regional change³ and in the last five years interest has turned to the development of industrial districts such as the 'Third Italy', which are seen to be centres for flexible accumulation.⁴ Within that corpus of research, intra-metropolitan location has, for

¹ M.J. Boddy, "Structural approaches to industrial location" in W.F. Lever (ed.), Industrial Change in the United Kingdom (London: Longman, 1987), pp. 56-66.

² G. Sternlieb and J.W. Hughes (eds.), Post-Industrial America: Metropolitan Decline and Inter-Regional Job Shifts (New Brunswick: Center for Urban Policy Research, 1975); D. Perry and A. Watkins, The Rise of the Sunbelt Cities (Beverly Hills: Sage, 1977); B. Bluestone and B. Harrison, The Deindustrialization of America (New York: Basic Books, 1982).

³ D. Massey, Spatial Divisions of Labour: Social Structures and the Geography of Production (London: Macmillan, 1984).

⁴ M. Piore and C.F. Sabel, The Second Industrial Divide: Possibilities for Prosperity; (New York: Basic Books, 1984); A.J. Scott, "Flexible production systems and regional development: the rise of industrial spaces in North America and Western Europe", International Journal of Urban and Regional Research, 1988, 12, pp. 171-186; M. Storper and A.J. Scott, "The geographical foundations and social regulation of flexible production complexes" in J. Wolch and M. Dear (eds.), The Power of Geography: How Territory Shapes Social Life (Winchester, Mass.: Unwin, Hyman, 1989), pp. 21-40.

various reasons, been relatively neglected. One reason lies in the greater importance attached to regional development, the emphasis of which has been upon the locational reach of firms with multiple locations. A second reason is that the timing, nature and form of urban industrial geography is supposedly well-known and uncontested. Lastly, the urban field has been left increasingly to social and cultural geographers. Only when it refers to the wider regional context or as a framework for the social and cultural landscape does the city's industrial geography become a subject of concern, and then fleetingly.

This, of course, does not mean that urban industrial geography has not had its practitioners. Since Alfred Weber's conceptualization of urban industrial space at the turn of the century, his work has been updated and modified by writers such as Hoover and Vernon, Fales and Moses, Allan Pred, and, more recently, Allen Scott. Despite their different perspectives, all have accepted a separation of industrial space into two distinct spheres, namely the core and periphery. Most of these writers identify a rupture in the industrial urban fabric in the first few decades of the twentieth century. They describe a decentralization of industry to the urban periphery and a decline in the importance of the tightly-packed industrial agglomeration at the city core. They represent this rupture as the transformation of the nineteenth-century industrial city into the twentieth-century corporate city and attribute the spatial split either to technological innovations in industry or to the development of new modes of transportation.

The accepted picture of the location of production from the mid-nineteenth-

century to at least the 1920s is one dominated by the centralization of economic activities in the city core.⁵ Manufacturing establishments, so the argument goes, were clustered centrally, close to transportation nodes, with a zone of working-class homes located near production sites. Thus Warner, in his description of Philadelphia in 1860, states that "most areas ... were a jumble of occupations, classes, homes, immigrants, and Native Americans".⁶ The critical force behind the centralization of production has been seen to be agglomeration economies where the needs of firms lead them to associate in close proximity one to another. These economies are associated with the development of external economies of scale in which complexes of firms arise from the collective use of transportation and communication networks, and production costs are reduced by the shortening and profusion of inter-firm linkages. In the nineteenth century, agglomeration economies are seen as causing the development of a spatial complex of firms of all sizes in a small and central part of the city. According to Scott, these central complexes are characterized by the functional relationship of the linkages between firms, uncertain and changing

⁵ K.T. Jackson, Crabgrass Frontier: The Suburbanization of the United States (New York: Oxford University Press, 1985); P.O. Muller, Contemporary Suburban America (Englewood Cliffs: Prentice-Hall, 1981); A.R. Pred, "The intrametropolitan location of American manufacturing", Annals of the Association of American Geographers, 1964, 54, 165-180; A.J. Scott, "Locational patterns and dynamics of industrial activity in the modern metropolis", Urban Studies, 1982, 19, pp. 111-142; R. Walker, "The transformation of urban structure in the nineteenth century and the beginnings of suburbanization" in K. Cox (ed.), Urbanization and Conflict in Market Societies (Chicago: Maaroufa Press, 1979), pp. 165-212 and "A theory of suburbanization: capitalism and the construction of urban space in the United States" in M. Dear and A.J. Scott (eds.), Urbanization and Urban Planning in Capitalist Society (New York: Methuen, 1981), pp. 383-429; D. Ward, Cities and Immigrants (New York: Oxford University Press, 1971); S.B. Warner, The Private City: Philadelphia in Three Periods of its Growth (Philadelphia: University of Pennsylvania Press, 1968); O. Zunz, The Changing Face of Inequality (Chicago: The University of Chicago Press, 1982).

⁶ Warner, The Private City, p. 50.

demand, the inability to standardize production, and their lack of internal economies of scale.⁷ In this view - a view that has held considerable sway over a generation of researchers - the upper and middle classes suburbanized after mid century, leaving industry and the working class in the city core. While it is conceded that some firms were located in non-central sites, these, for the most part, have been seen as aberrations.

The overriding view picture that this position presents of the industrial geographic configurations of the city is one which falls within the traps of dualistic thinking and generalization.⁸ Most geographic work has set out to prove a series of generalizations through the elucidation of regularities between objects. As Sayer points out, it is impossible to "replicate" findings in the social sciences because of the diverse and qualitative differences that occur within society in which there is a synthesis of the causal powers of the structures in question.⁹ A particular flaw of generalization, and even work following the abstraction mode, has been a tendency towards dualistic thinking.¹⁰ Geographic thought is full of dualisms: small versus large scale; central city versus suburbs; fordism versus flexible accumulation; agency versus structure. Yet, if all phenomena that geographers study are products of a vast

⁷ Scott, "Locational patterns, p. 126.

⁸ R.A. Sayer, "Dualistic thinking and rhetoric in geography", *Area*, 1989, 21, 3, pp. 301-305; K. Williams, T. Cutler, J. Williams and C. Haslam, "The end of mass production?", *Economy and Society*, 1987, 16, pp. 405-439.

⁹ R.A. Sayer, "Explanation in economic geography: abstraction versus generalization", *Progress in Human Geography*, 1982, 6, pp. 68-88.

¹⁰ Sayer, "Dualistic thinking".

multitude of processes, how is it possible to construct theories which are so conveniently dichotomous in nature?

The same problems have also restricted our understanding of the evolution of the industrial geography of cities. This is especially true with regard to the conception of space. Dualisms and over-simplification dominate the discussion of the transformation of urban industrial structure. Urban industrial space is set up as a polarization of central and suburban spaces with generalizations about the role of technology, transportation, and agglomeration economies providing the theoretical explanation for the division and fragmentation of the urban industrial landscape. A good illustration of this can be found in the decentralization (itself a dualistic notion) of firms from city core to suburbs. For many writers the mainspring of industrial decentralization lies in the emergence of large-scale, capital-intensive, standardized, and mechanized firms employing large numbers of unskilled and semiskilled workers. In the city core, they argue, remained smaller firms which employed batch production methods, little machinery and a larger proportion of skilled labour. This dichotomy has been enshrined in the product cycle theory as well as in Weberian, neo-classical, Marxian and transactional theories. While the polarity between central/small and peripheral/large has some validity, it is only part of the picture. It forecloses other attributes of industrial location in the city and relegates other possibilities to the realm of 'residuals'. The foreclosing of the diverse array of social and spatial forms and practices stems from two weaknesses: geographers' inadequate abstraction of the overdetermined, and thus multi-dimensional, character of urban

industrial processes and in the social sciences generally, a neglect of the meaning of space.

Only with the advent of the twentieth century, goes the argument, did industry begin to decentralize, and then only slowly. The rate of decentralization has been debated. On one side, G.R. Taylor saw the industrial exodus to satellite cities as having "taken on the proportions of a big sweeping current" which is spreading through suburban areas and creating new towns. In a survey of the thirteen largest industrial districts in the United States, G. E. McLaughlin concluded,

the dominance of the major city in manufacturing employment has tended to lessen significantly since 1879. A great expansion in factory employment particularly since 1899, has occurred in suburban districts either in smaller communities or in previously unsettled districts where satellite manufacturing centers have grown up.

According to D. Gordon, at the turn of the century a significant number of large-scale firms relocated from the city core to more peripheral areas. On the other side, C. Woodbury states that after 1900 there was a "slow, but rather persistent diffusion of industry within the major areas or districts of industrial concentration". More recently, Allen Scott has stated that centralized production was "characteristic of the large metropolis well into the twentieth century. Even by the time of World War II, the core of the large cities in the United States were still typically given over to a considerable degree of industrial production".¹¹

¹¹ G.R. Taylor, Satellite Cities: a Study of Industrial Suburbs (New York: D. Appleton and Co., 1915), p. 4; G.E. McLaughlin, Growth of American Manufacturing Areas: a Comparative Analysis with Special Emphasis on Trends in the Pittsburgh District (Pittsburgh: Bureau of Business Research, University of Pittsburgh, 1938), p. 127; D.M. Gordon, "Capitalist development and the history of American cities" in W.K. Tabb and L. Sawers (eds.), Marxism and the Metropolis (New York: Oxford University Press, 1978), pp. 25-63; C. Woodbury, "Industrial location and urban redevelopment" in C. Woodbury (ed.), The Future

In the many attempts to explain the apparent centralization of production in the nineteenth-century city and the cleavage after 1900, two dominant paradigms can be delineated. The first, stemming from the work of Weber, emphasizes the importance of agglomeration economies and transportation costs. The second, largely the work of Allen Scott, centres upon the transactional activity of firms within a wider economic context.¹² It is to an examination of these two bodies of work that I now turn.

2.2 The Weberian Tradition

The principal factors identified in classical intra-metropolitan location theory are agglomeration economies and transportation costs. The notion of agglomeration economies originated in the work of Alfred Weber and was introduced into industrial economics through the work of Alfred Marshall.¹³ According to Weber the cluster of productive units in a city will provide economies external to a particular firm. The advantages firms provide one another offset transport costs and distort the pattern

of Cities and Urban Redevelopment (Chicago: University of Chicago Press, 1953), pp. 286, 287; A.J. Scott, "Production system dynamics and metropolitan development", Annals of the Association of American Geographers, 1982, 72, p. 188.

¹² Another stream in industrial location theory is that of neo-classical economics. I do not review it here as it has not, to any great degree, been utilized in analysing nineteenth and early twentieth-century cities even though the factors that Weberian scholars have seen as being central to urban industrial location such as agglomeration economies and transportation costs have been analysed within a neo-classical framework. At the same time I do not refer to more recent refinements of Weberian theory such as the product cycle because they, like neo-classical location theory, have not been introduced into the interpretation of nineteenth-century urban industrial geography.

¹³ A. Weber, Theory of the Location of Industries (Chicago: University of Chicago Press, 1929), chap. 5; A. Marshall, Principles of Economics (London: Macmillan, 1961), chap. 10.

of regional location centred on transportation patterns. This idea was extended and refined by a number of writers notably Edgar Hoover.¹⁴

According to Hoover, Weber's theory of agglomeration where there was a tension between a single agglomerative force and a single deagglomerative one was too simple an explanation for the concentration of industry in the city. He identified three quite different influences upon the formation of industrial clusters: localization economies, scale economies, and urbanization economies. The notion of localization economies refers to the lowering of the costs of production as a result of the growth of the city with respect to increasing specialization and expanding output of one industry. The central concern is to identify the linkages within an industry and how firms are able to reap certain economies through the pooling of common resources such as labour markets, transfer costs, marketing networks and information flows. At the same time, as certain firms or industries grow larger there is an increasing division of labour and the development of internal economies of scale. These scale economies give rise to a variety of locational needs such as the need for larger amounts of land, which may lead to decentralization. By themselves, however, localization and scale economies do not provide a full explanation for agglomeration as they refer only to the single firm or industry. The term urbanization economies, on the other hand, refers to advantages which accrue to firms from the vast range of urban qualities such as the lower cost of water, sewerage and fire insurance,

¹⁴ E.M. Hoover, Location Theory and the Shoe and Leather Industries (Cambridge: Harvard University Press, 1937), pp. 89-111.

development of dense labour markets, and linkages between industries. Development of the city brings forth a host of advantages which attract other concentrations of industries.¹⁵ Hoover, building upon Weber's description of agglomeration economies, laid the basis for one of the central features of the study of the industrial geography of the city.¹⁶

At the urban scale then, the economies of agglomeration can be understood as having two effects. In the first place, the explanation for the concentration of firms in a centrally-located complex revolves around the reduction of communication and transport costs, the creation of closer physical ties, and accessibility to markets. The development of dense complexes of productive activity composed of a large number of firms enables these firms to take advantage of lower costs of transport and communication through the shortened distances among them. At the same time, agglomeration facilitates exchange through making comparisons easier, by pooling diverse buyers, sellers and information, by permitting economic actors to complete specialized and extended transactions, and by providing access to credit. The proximity of firms that agglomeration makes possible also extends the size of the

¹⁵ Hoover, Location Theory, pp. 89-111.

¹⁶ Other studies which have seen agglomeration economies as the core of urban industrial complexes are J.H. Bater, "Industrialization in nineteenth-century St.Petersburg: the role of linkages in shaping locational patterns" in L. Collins and D.F. Walker (eds.), Locational Dynamics of Manufacturing Activity (London: Wiley and Son, 1975), pp. 255-278; B. Chinitz, "Contrasts in agglomeration: New York and Pittsburgh", American Economic Review, 1961, 51, pp. 279-289; P. Hall, The Industries of London (London: Hutchinson, 1962); E.M. Hoover and R. Vernon, Anatomy of a Metropolis, (Cambridge: Harvard University Press, 1959); A. Pred, "Manufacturing in the American mercantile city: 1800-1840", Annals of the Association of American Geographers, 1966, 56, 2, pp. 307-338; R. Struyk, "External economies and the distribution of industrial growth within the metropolis", Review of Regional Studies, 1972, 3, pp. 23-34; R. Struyk and F. James, Intrametropolitan Industrial Location (Lexington, Mass.: D.C. Heath, 1975).

markets that firms can service, which in turn allows lower thresholds for producers of specialized goods. A particularly important market is that of labour. Agglomeration allows employers to take advantage of a large and diverse labour force in terms of quantity, quality and price. The end result is that firms, through clustering, are able to reduce their transaction costs.

The second effect is a result of "economies that accrue by reason of increases in the number of firms and the total quantity of output in any given area."¹⁷ Agglomeration economies are particularly important to small firms as they cannot internalize all of their needs. The small firms that take advantage of agglomeration economies are characterized by the breakdown of the production process into a large number of privately separate but yet functionally connected activities. Because of the disintegration of production, small firms are reliant upon external economies of scale because their many labour processes cannot be integrated into machine systems; their various processes of production have different optimal scales of operation; the need to spread the risks of uncertainty throughout the system; and the narrow extent of the market.¹⁸ At the same time, producers are able to carry the cost of public supplied infrastructures.

The other feature of Weberian theory which has shaped urban industrial geography is transport costs. Moses and Williamson, in a neo-classical version of nineteenth-century industrial location, argued that transport costs were of decisive

¹⁷ Scott, "Locational patterns", p. 118.

¹⁸ M. Storper and R. Walker, The Capitalist Imperative: Territory, Technology and Industrial Growth (New York: Basil Blackwell, 1989), p. 79.

importance: lower transport costs incurred by firms in the urban core outweighed the higher prices for land and wages, and had the effect of stimulating industry to locate centrally. In the nineteenth century technological advances in transportation further concentrated industry in the core, as the cost of moving goods between cities was lowered more rapidly than the cost of moving goods within cities.¹⁹ This position was based upon earlier work by Moses who, contrary to Weber and Isard, argued that it is possible to have more than one optimal location for each firm. Factor substitution, influenced by variations in transportation costs, affect, in turn, the manner in which outputs, inputs, prices and location are adjusted. At each level of output the optimal combination differs, and as the production function is not homogeneous there can be no single optimal location.²⁰

These two features of Weberian theory have strongly influenced the analysis of intra-metropolitan industrial location undertaken by geographers, regional scientists and historians. Although the economic elements of this position have not always been explicitly outlined by writers, there is a general consensus that agglomeration economies and shifts in transportation technology that were associated with other forms of technological change are the principal forces underlying the spatial structure of urban industry since the mid-nineteenth century. It is also generally accepted that the next round of transport innovations at the turn of the

¹⁹ L. Moses and H. Williamson, "The location of economic activity in cities", American Economic Review, 1967, 57, pp. 211-222. See also R.L. Fales and L.N. Moses, "Land use theory and the spatial structure of the nineteenth-century city", Papers of the Regional Science Association, 1972, 28, pp. 49-80.

²⁰ L.N. Moses, "Location and the theory of production", The Quarterly Journal of Economics, 1958, 72, pp. 259-272.

century were the cause of the decentralization of industry. The introduction of the streetcar and the truck resulted in the reduction of transportation costs and the breaking apart of the dense complex of linkages in the core through the development of internal economies and the growing agglomeration diseconomies.

A central theme in that literature has been the attempt to theorize urban industrial geography in terms of a core/periphery split. Writers argue that breakthroughs in transportation technologies - the electric streetcar, the automobile and truck - enabled firms and workers to relocate to the suburbs. Until the 1890s the absence of a rapid transit network and the higher costs of intra-urban compared to inter-urban transportation were powerful obstacles to the decentralization of industry. The centrality of industry was reinforced by the powerful impulses of linkages between firms and their dependence upon centrally located transportation facilities such as harbours and railway terminals.²¹ The technological innovations introduced by the end of the century not only widened the spatial reach of firms but also allowed them to take advantage of benefits that were attributed to the fringe - cheap land, low taxes and 'elbow room'. The result, according to Kenneth Jackson, was that "between 1915 and 1930, when the number of American trucks jumped from 158,000 to 3.5 million ..., industrial deconcentration began to alter the basic spatial pattern of metropolitan areas".²²

Although there is little doubt that the central core was the locus of industry

²¹ Fales and Moses, "Land use theory and spatial structure"; Jackson, Crabgrass Frontier; Pred, "The intrametropolitan location of American manufacturing".

²² Jackson, Crabgrass Frontier, p. 184.

and employment throughout the nineteenth century, recent research by historians and geographers raises questions concerning the validity of interpreting the movement of industry solely as a function of transportation and or the disintegration of agglomeration economies. While the concept of the economies of agglomeration is a powerful tool for understanding the evolution of urban industrial geography, it suffers from a number of important omissions.

In the first place, this position concentrates too heavily upon the role of linkages, especially when cities with a wide industrial mix are under consideration. Although firms are dependent upon the efficient coordination of their input and output relations, to view their locational choices as reliant upon the linkages between them is an overstatement. Weberian theory has neglected the locational implications of processes internal to industry such as technological change, the scale and type of firm and industry organization, the nature of the labour process, and the composition of the labour force.²³ As industries follow different trajectories of growth and change, the abstract model of the single firm operating in a rational and equilibrium world cannot provide a basis for understanding the multiple and fragmentary character of the structure of economic space.²⁴

²³ R. Walker, "Technological determination and determinism: industrial growth and location" in M. Castells (ed.), High Technology, Space and Society (Beverly Hills: Sage, 1985), pp. 226-264 and "The geographical organization of production-systems", Environment and Planning D, 1988, 6, pp. 377-408.

²⁴ A discussion of the epistemology of Weberian theory and its offshoots can be found in D. Massey, "A critical evaluation of industrial location theory" in F.E.I. Hamilton and G.J.R. Linge (eds.), Spatial Analysis, Industry and the Industrial Environment: Progress in Research and Applications, vol. 59 (Chichester: Wiley, 1979) and N. Smith, "Uneven development and location theory: towards a synthesis" in R. Peet and N. Thrift (eds.), New Models in Geography: the Political-Economy Perspective (London, Unwin Hyman, 1989), vol. 1, p. 144.

An associated problem relates to the position of transportation in the conceptual framework. Placing transportation as the fundamental mechanism of change is to put the cart before the horse. Transportation is a response to wider economic and social forces, and as such, does not and cannot explain changing urban structure. The focus upon transportation as the motor of change is misplaced. As one writer states, "transportation is the agency through which certain structural transformations take place".²⁵ There is strong evidence to indicate that decentralization of industry was occurring long before the effects of transportation technologies could be felt.²⁶ Transportation is merely one of the factors that facilitated changes to urban structure.

Secondly, in its reliance upon the reduction of economic costs, the classical approach to industrial location downplays the way that industrial space is fashioned by the social relations of production and the development of the built environment. It relegates other phenomena such as housing supply, labour costs, state regulation, ethnicity, and the active construction of urban infrastructure to an insignificant role in shaping economic space. These factors are seen to play little role in the shaping of the locational coordinates of firms, even though some of them are formulated within urbanization economies: they emerge as needed and are uncontested.

Lastly, in the reliance on viewing urban industrial space as revolving around

²⁵ J. Vance, "Housing the worker: the employment linkage as a force in urban structure", Economic Geography, 1966, 62, p.298.

²⁶ D.M. Gordon, R. Edwards and M. Reich, Segmented Work, Divided Workers (New York: Cambridge University Press, 1982).

the formation and dissolution of agglomeration economies, there is a tendency to replace the complexity of industrial structure to a dualistic model: firms either take advantage of agglomeration economies or they do not, and this corresponds to a preference for either core or periphery, two crudely defined notions. This is reflected in the reduction of the wide spectrum of firms and industrial organization into two spheres: those with internal and those with external scale economies. Industries, however, have always been characterized by a significant degree of organizational diversity. This raises the question of whether a model of an industrial monocentric city in the nineteenth and early twentieth century adequately reflects the reality of industrial organization and urban structure. A central feature of the development of a monocentric city is the idea that technological change was linear and monotonic. Throughout the nineteenth century, however, industry was characterized by a great diversity of organizational forms. The Weberian model treats industry as if it were all of one type, functioning according to the same rationale, despite evidence for the great variety of scale, type and labour processes among firms.²⁷ While it is often stated that capitalist relations of production gave rise to multiple nodes of employment little work has been done to specify the importance of nineteenth-century urban industrial districts outside the "downtown" despite the evidence that

²⁷ For some excellent examples of diverse nineteenth-century workplaces see B. Laurie and M. Schmitz, "Manufacture and productivity: the making of an industrial base, Philadelphia, 1850-1880" in T. Hershberg (ed.), Philadelphia: Work, Space, Family and Group Experience in the Nineteenth Century (New York: Oxford University Press, 1981), pp. 43-92; I. McKay, "Capital and labour in the Halifax baking and confectionery industry during the last half of the nineteenth century", Labour/le Travailleur, 1978, 3, pp. 63-108; R. Samuel, "Workshop of the world: steam power and hand technology in mid-Victorian Britain", History Workshop, 1977, 3, pp. 6-72. From a geographical perspective, A. Pred, "The intrametropolitan location" pp.170-171 refers to this diversity.

a number of cities contained important non-central industrial districts from as early as the mid-nineteenth century.²⁸

2.3 Allen Scott and Transactional Analysis

Recently, Allen Scott has developed a theoretical position which challenges some aspects of the classical Weberian approach and has added many refinements to our understanding of the mechanisms underlying urban industrial geography.²⁹ Using an eclectic mixture of Marxian, Weberian, and transactional theories, he has pointed to the internal dynamics of production as a central feature in the structuring of urbanization and intra-metropolitan industrial location. According to Scott, in Weberian and neoclassical models, "the weight of analysis and investigation was ... thrown dominantly upon the structure of transport costs and the abstract rationality of individual spatial behavior and decision making".³⁰ This resulted in the reduction

²⁸ For example, Richard Walker talks of "the partial polynucleation of employment and attendant working-class districts" and David Ward of the development of "satellite cities and industrial suburbs". In both cases these non-central industrial districts are given short shrift and are relegated to a subsidiary position within their perspective of the overall development of urban industrial geography. See Walker, "The transformation of urban structure", p. 201 and Ward, Cities and Immigrants, p.100. On the development of non-central districts in Baltimore and Philadelphia see E.K. Muller and P.A. Groves, "The emergence of industrial districts in mid-nineteenth century Baltimore", Geographical Review, 1979, 69, pp. 159-178 and P. Scranton, Proprietary Capitalism: the Textile Manufacture at Philadelphia, 1800-1885 (New York: Cambridge University Press, 1983).

²⁹ Scott's thought has changed over the last decade. The overview presented here is distilled from "Locational patterns"; "Production system dynamics"; "Industrial organization and the logic of intra-metropolitan location: I. theoretical considerations", Economic Geography, 1983, 59, pp. 233-250; "Location processes, urbanization, and territorial development: an exploratory essay", Environment and Planning A, 1985, 17, 4, pp. 479-501; "Industrialization and urbanization: a geographical agenda", Annals of the Association of American Geographers, 1986, 76, 1, pp. 25-37; "Industrial organization and location: division of labor, the firm, and spatial process", Economic Geography, 1986, 62, 3, pp. 215-231; Metropolis: From the Division of Labor to Urban Form (Berkeley: University of California Press, 1988).

³⁰ Scott, "Industrial organization and the logic of intra-metropolitan location", p. 233.

of urban industrial location theory to "a mere adjunct to the theory of residential land use". To escape this straitjacket, Scott argued that theory had to "relate production itself to a conception of capitalism as a set of human relationships built up around the central mechanisms of the labor process, the distribution of the economic surplus, and accumulation".³¹ To this end, Scott attempts to extend the classical position by deepening the analysis of agglomeration economies and transport links through use of transactional activity. Instead of cost factors, his 'pivotal variable' is the organization of the firm. It is this pivotal role of industrial organization which stands in contrast to classical writers.

The main thrust of Scott's theory is that the dynamics of commodity production create complexes of vertically-disintegrated producers which are clustered, usually, in the urban core. These complexes tend to grow through the intensification of the division of labour, the vertical disintegration of functions, and the development of specialized services and sub-contracting activities. As inter-linkages develop within these complexes, the costs of production are reduced, leading to a further stimulation of the connection between firms. At the same time, urban areas are further transformed as the labour force, and residential and political structures are geared to perpetuate these complexes. Eventually, with the success of these dense networks of firms, constraints emerge which hinder their further development. These constraints are overcome through technological and organizational change, and through relocation to the periphery.

³¹ Scott, "Industrial organization and the logic of intra-metropolitan location", p. 234.

This, in a nutshell, is Scott's main argument. To understand his thinking, we need to consider in more detail the crucial internal dimensions of production and their locational implications. Basing his work on Coase³², Scott constructs a theoretical edifice on the transactional activities of firms. Firms are part of a series of economic transactions which when they intersect with the division of labour produce two major types of industrial structures. The first, small-scale, labour-intensive industries, are characterized by uncertain and rapidly changing demand, severe obstacles to mechanization, and the inability to standardize the flow of inputs and outputs. In this situation transaction costs are high, external economies of scale are impossible to achieve, and firms through an elaborate division of labour are divided into a number of specialized and vertically-integrated producers. The second type of industrial structure consists of large-scale, capital-intensive firms in which the possibilities of technical economies, the extension of the scope of administration of the firm and the problems associated with bottlenecks and uncertainties bring about vertical integration.

According to Scott this dual typology worked itself out in cities in such a way that prior to World War I most industry was centrally located, while after World War I industry began to decentralize to the urban periphery. In the nineteenth century, he says, both small and large firms sought central locations. Small firms, due to their disintegrated character, coalesced into a centrally located complex of independent producers linked together by external economies of scale. The large firms required

³² R.H. Coase, "The nature of the firm", *Economica*, 1937, 4, pp. 386-405.

locations in close proximity to rail and and water transportation "where they could efficiently assemble the raw materials they required, exchange inputs and outputs among one another, and then efficiently dispatch final products back to the metropolitan hinterland and beyond".³³

The suburbanization of industry began slowly after the turn of the century, and reached a massive flow after World War II as firms became vertically integrated and agglomeration economies decreased in importance. According to Scott, the development of suburban complexes of productive activity after World war I was based upon the outcome of technological changes within firms which led, over time, to increasing standardization, the deskilling of labour, and growing internal economies of scale and scope.³⁴ He suggests that firms can be placed into two spheres of production, what he calls vertical disintegration and vertical integration. Over time, vertically integrated firms, because of the degree of standardization that has taken place within them, are less dependent upon large flows of transactional activity with other firms. No longer reliant upon the benefits accruing from centrally-located agglomerations, the larger, capital-intensive firm is more likely to seek locations where labour is cheaper, new technologies can be established, and land costs are smaller. They are then more likely to choose locations far from the city core.

³³ Scott, "Production system dynamics", p. 187.

³⁴ Although similar to the product cycle theory, Scott's interpretation of decentralization differs in some important ways. See Metropolis, pp. 205-208. Also see Storper and Walker, The Capitalist Imperative, pp. 85-88.

The first problem with Scott's theory is that it is one of exchange despite his insistence on the centrality of production. Although he attempts to transcend classical positions which are centered upon cost factors, he is unable to do this because of his reliance on transactional analysis. In Scott's work, as one writer has recently stated, "changes in the organization and control of production are seen mainly as a response to changes in the costs of various exchange relationships, in markets or within the firm".³⁵ The reliance on the cost of transactions between firms does not take into consideration the social relations of production which often established a series of forces that undermined the purely market component of locational choice.

A second problem relates to Scott's tendency, like that of previous writers, to treat the firm as an abstraction. While the two-fold typology is a major advance on earlier work, he still squeezes all firms into only two possible categories.³⁶ Any firm which does not fall into one of the two categories is, by definition, excluded from his analysis. At the same time, there is the assumption that all firms in each of the binary structures are identical in their needs and use of space. The picture is one where industrial organization is characterized by mutually exclusive spheres where large and small firms seem to function in different worlds. This is paralleled by the analytical separation of the processes of spatial centralization and decentralization.

³⁵ N. Thrift, "Review of Metropolis: from the Division of Labor to Urban Form", Progress in Human Geography, 1989, 13, p. 608.

³⁶ Although Scott, in a number of places, states that firms can be "arrayed along a continuum", i. the final analysis he continues to cast the internal structure of firms as either disintegrated and integrated.

Although a formal separation of the two may be necessary for comprehending the different dynamics underlying them, Scott is unable to weld them into a coherent appreciation of the formation of urban industrial districts.

Third, his work is situated in an historical vacuum. His aim was to construct a theory centred upon the "set of human relationships" but he ends up presenting a limited account of industrial and locational change. There are significant silences in his work which reflect the want of historical specificity. I have already mentioned his inability to introduce the full range of industrial organization into his theory. Just as important is the lack of autonomy given to other real-world dynamics. Labour, the built environment and the state are seen as arising out of the dynamics of production with no reference to the dialectic relationship existing between production and society. The result is that Scott's picture of the past urban industrial landscape is a starkly denuded one where firms are shorn of their differences, where new productive spaces arise, phoenix-like, from the ashes of transactional theory, and the flames of class conflict are under the control of capital. In other words, his theory is not situated within a historical context.³⁷

Finally, the changes associated with the business cycle and long waves such as technological change are either ignored or fetishized. For instance, he maintains that technological advances at the turn of the century led to standardization of production and the deskilling of labour. That this was a more diffuse situation than

³⁷ An example of this is his failure to cite works which do not 'fit' into his analysis. The most noticeable omission is Muller and Groves, "The emergence of industrial districts".

he gives credit for is one thing. It is another to see these changes as producing a restructuring of urban space as firms became, a priori, less dependent on spatial dependency with other firms and with a central labour pool.

2.4 Conclusion

The concern of this chapter has been to point out that many commentators have stressed the importance of transportation costs and the economies of agglomeration - in both its conventional Weberian form or the "post-Weberian" guise of Scott - for urban industrial geography. Indeed the rupture of urban industrial space that, it is believed, occurred in the first decades of the twentieth century has been seen as resulting from the break-down of the agglomeration economies that tied industry to the core of the nineteenth-century city through innovations in industrial and transportation technologies.

There is little doubt that Scott's work is a major advance upon conventional Weberian approaches to urban industrial geography. Nonetheless, there are some fundamental flaws in his theoretical conception of intra-metropolitan locational change which in many ways parallel those of previous writers. The models created by Scott and others have been constructed in such a way as to deny the historical specificity of the productive and spatial components of industrial location. This is especially striking with regard to the way that the labour process and the built environment are integrated into their models. These models are based on a calculus which reduces the structured choices of individual capitalists to a polarized one

where exchange mechanisms are the determining forces underlying the formation of industrial spaces; where choices are made according to some rational, omnipresent knowledge of economic costs on the part of manufacturers³⁸; and firms obey the dictates of either centripetal or centrifugal forces. This leads to a situation where these writers neglect the diverse cross-currents associated with technological change, the development of the labour process, and the organizational complexity of firms. They also neglect some critical features of the social relations of the formation of space such as the socio-political context of the construction of the built environment.

I would like to stress here that while agglomeration economies and technological developments in transportation played an important part in the formation of the industrial landscape through the development of tightly clustered nodes of industrial activity, the single, centrally-located node is only one aspect of the industrial geography of the city after 1850. One of the aims of this thesis is to present a theoretical contribution which indicates another approach to understanding the formation of urban industrial space. Rather than relying on models in which a single or small number of exchange transactions provide the foundation of economic and spatial processes, I turn to an elucidation of the manner in which both industry and industrial space are constructed. In other words, I seek to explain the industrial geography of the city in terms of the formation of productive strategies and

³⁸ As David Smith points out, the portrayal of manufacturers behaving in a rational manner and with a single end (*homo economicus*) is not one confined to positivist social scientists. Much of Marxist industrial location theory is taken from a philosophical position which relies on, what he calls, *homo marxicus*. See "Neoclassical location theory" in Lever (ed.), Industrial Change in the United Kingdom, pp. 23-37.

productive spaces which were frequently refashioned through uneven waves of growth. I shall show that a series of non-central nodes of economic activity was a consistent and important component of the capitalist urban landscape between 1850 and 1918. To understand the forces underlying the formation of industrial spaces, it is necessary to examine the forms which capitalist industrial development can take and the manner in which the urban built environment is constructed. To this end, Chapter Three explores two themes: the diversity of industrial production formats apparent in each broad front of economic growth, and Chapter Four examines the forces responsible for the development of productive spaces.

CHAPTER 3 PRODUCTION FORMATS

The purpose of this chapter is to present the notion of production formats as an alternative to the dominance of the corporation as an explanatory structure in our understanding of industrial development and as a means to order the diverse organizational configurations that industry can take. I will argue that the essentialist vision of technological change underpinning the rise of the corporation does not convey the full complexity of the processes underlying the formation of urban industrial complexes. The discussion in this chapter revolves around three themes: the multiple paths that industry may take; the concurrent evolution of the several forms of industry; and the appearance of those features of urban growth since the mid-nineteenth century. The argument presented in this section is that the focus upon the corporation as the agent of change in industrial and spatial structures is misplaced (3.1). A consideration of the divergent paths firms can take is then outlined with reference to technology, the labour process and production organization. Divergent paths are reformulated through the concept of production formats (3.2). The impact of restructuring through time as it relates to industrial and urban change is then considered (3.3).

3.1 The Corporation as Agent of Change

The classic scenario of North American industrialization is the transformation of the firm since 1850 from a small, localized, labour-intensive unit to a large, capital-intensive corporation which occupies several sites and has extensive markets.

With the development of new technologies such as steel and electricity, and the widening of markets at the end of the nineteenth century, it is argued, the large, multi-unit firm was able to exploit economies of scale and scope, and reduce transaction costs. The larger scale of operations spread over several plants enabled firms to reduce unit costs in several ways: the reduction of managerial costs, the specialization of plants, the centralization of research facilities, the intensification of the speed of materials through the plants, and the increasing control over distribution networks. Firms were able to gain advantages in production and distribution through internalizing the processes that were previously done outside the firm. Large firms could also take advantage of economies of scope - economies "resulting from the use of processes within a single operating unit to produce or distribute more than one product".¹ At the end of the century, the tobacco giant, American Tobacco, for example, was able to capture a large share of the industry through its ability to monopolize most of the industry's separate branches.²

According to this perspective, the ability of firms to expand their production through the economies of scale and scope permitted transaction costs between firms to be reduced as processes internal to the firm were performed more efficiently. The decreasing reliance of corporations on centrally-located external economies such as linkages, face-to-face contacts, skilled labour, and the need to lower transportation

¹ A.D. Chandler, Scale and Scope: the Dynamics of Industrial Capitalism (Cambridge: Belknap Press, 1990), p. 18.

² A.D. Chandler, The Visible Hand: the Managerial Revolution in American Business (Cambridge: Belknap Press, 1977).

costs was associated with changes internal to the firm - increasing mechanization and scale, the development of managerial hierarchies, and the growth of highly segmented labour markets. The corporation was, after 1880, operating in a new economic environment; instead of the competitive economic milieu of the nineteenth century, it made the transition to the Fordist period of mass production in the twentieth century. Characteristic of the large, multi-unit corporation was an elaboration of internal organization and a reduction in linkages between firms. The pioneers of this complexity were the railroads which, after the middle of the nineteenth century, devised an elaborate system of hierarchical control.³ As one historian has said, "the largest factories of the World War I era differed significantly from the largest factories of the previous generation" in their size, amount of mechanization, specialization of function, and degree of managerial control over workers' activities.⁴

Two primary reasons have been given for the rise of the corporation. The first rests upon a technologically determined perspective. The following quote from Chandler is representative of this view:

³ The most influential work on this has been done by A.D. Chandler. See his Scale and Scope, The Visible Hand and "Technology and the transformation of industrial organization" in J. Colton and S. Bruchey (eds.), Technology, the Economy, and Society (New York: Columbia University Press, 1987), pp. 56-82. Also see H. Braverman, Labor and Monopoly Capital: the Degradation of Work in the Twentieth Century (New York: Monthly Review Press, 1974); D. Clawson, Bureaucracy and the Labor Process (New York: Monthly Review Press, 1980); R. Edwards, Contested Terrain: the Transformation of the Workplace in the Twentieth Century (New York: Basic Books, 1979); K. Stone, "The origins of job structures in the steel industry" in R. Edwards, M. Reich and D. Gordon (eds.), Labor Market Segmentation (Lexington, Mass: D.C. Heath, 1977), pp. 27-84.

⁴ D. Nelson, Managers and Workers: Origins of the New Factory System in the United States, 1880-1920 (Madison: University of Wisconsin Press, 1975), p. 9.

This transformation from single-unit of[sic] multi-unit enterprises, from market to administrative coordination, from fragmented to concentrated industrial structure, and from price to functional and strategic competition was technologically engendered. It resulted primarily from the coming of new technologies of production and distribution that vastly increased the volume of transactions that a single unit of distribution was able to handle. This profound transformation ... resulted ... from the coming of modern transportation and communication ... The effective operation of new technologies - the railroad, telegraph, steamship, and cable - demanded new forms of organization.⁵

The second explanation lies in social control. According to this view, the rise of the corporation was attributable not to technological change but rather to the need of capitalists to gain better control over their workers.⁶

The classic scenario which points to the dominance of the corporation by the end of the century identifies some genuine new elements in North American industrial history. In 1850 most firms were small family firms with a large share of skilled workers, and they served local markets. By 1918, there had appeared on the industrial landscape, at least in many industrial sectors, a few large, capital-intensive corporations employing a large, and mainly semiskilled, workforce, and utilizing massive mechanical energy and mass production techniques.⁷ Writers then slip into the mould of assuming that the reorganization of urban space was the product of the

⁵ Chandler, "Technology and the transformation of industrial organization", p. 58.

⁶ See Clawson's discussion of these two perspectives in Bureaucracy and the Labor Process, chap. 2. Studies that take this view are M. Burawoy, Manufacturing Consent: Changes in the Labor Process Under Monopoly Capitalism (Chicago: University of Chicago Press, 1979), and The Politics of Production (London: Verso, 1985); Edwards, Contested Terrain; D.M. Gordon, R. Edwards and M. Reich, Segmented Work, Divided Workers (New York: Oxford University Press, 1982); S. Marglin, "What do bosses do? The origins and functions of hierarchy in capitalist production", Review of Radical Political Economy, 1974, 6, pp. 60-112.

⁷ Chandler, The Visible Hand; Edwards, Contested Terrain.

emergence of the large-scale corporation. My questioning of that assumption is in two parts. First, the large corporation was not alone on the stage: its dominance in production is overstated, and we must balance our perception of North American industry by an appreciation of the diversity of sizes and strategies of enterprises. An important trend over the seventy years after 1350 is toward diversity as well as to increasing scale: we need to demonstrate the complementarity of industrial sizes and formats. Second, I challenge the assumption that the new and large corporations were the prime movers in the creation of new spaces and the new spatial order of the city.

The emergence of the large corporation as the defining element of industrial and spatial structure suffers from a number of problems. The first revolves around the question of whether the large corporation is a suitable model for understanding the full array of firms making up the industrial spectrum. Central to this question is the set of responses made by firms to externally generated changes. Writers have pointed to the development of a legal framework which facilitated corporate growth, to falling demand which led to overproduction, to escalating and internecine competition, and to growing labour unrest. They argue that uncertainty generated by these pressures forced firms to increase their internal economies of scale at the expense of external economies. More specifically, manufacturers were forced to adopt new techniques, to specialize their functions, to attend to the relationship between technological change and labour productivity, and to substitute managerial control for *ad hoc* methods of the past. In other words, firms had to choose between

batch and mass-production strategies.⁸ Firms that chose the former remained small and relatively labour intensive, while firms that chose the latter became large and capital intensive. The external pressures forced firms to reorganize their internal structure. Consolidated firms were able to concentrate on common products, to capture a larger potential market, and to earn higher profits on a larger output rather than a high margin per unit.

Was this in fact the case? As one writer states, "whether uncertainty translates into rising or falling internal economies ... depends on the context of economic practice and institutions".⁹ Between the extreme strategies of batch and mass production lay a wide variety of possible combinations. Further, there is a tendency to conflate empirical trends and abstracted theoretical propositions with the reality of what was occurring on the ground. Mass-production practices did not dominate until after World War II, and even then it is questionable whether these were the dominant practices of the economic system.¹⁰

We must also ask the question whether all large-scale firms fit the model. The ascendancy of the large corporation is usually demonstrated from figures which

⁸ N.R. Lamoreaux, The Great Merger Movement in American Business, 1895-1904 (New York: Cambridge University Press, 1985), chap. 2; Nelson, Managers and Workers, pp. 3-11.

⁹ J. Lovering, "Fordism's unknown successor: a comment on Scott's theory of flexible accumulation and the re-emergence of regional economies", International Journal of Urban and Regional Research, 1990, 14, p. 162.

¹⁰ M. Gertler, "The limits to flexibility: comments on the Post-Fordist vision of production and its geography", Transactions. Institute of British Geographers, N.S., 1988, 13, pp. 419-432; C. Sabel and J. Zeitlin, "Historical alternatives to mass production: politics, markets and technology in nineteenth-century industrialization", Past and Present, 1985, 108, pp. 133-176; K. Williams, T. Cutler, J. Williamson and C. Halsam. "The end of mass production?", Economy and Space, 1987, 16, pp. 405-439.

indicate that a small number of firms control a large share of the industrial output of an industry or nation. Despite a trend to concentration of large firms in some sectors, these large-scale firms may have behaved in different ways, employing their own forms of technology and organization, distinct strategies of marketing and containment of class struggle, and had different relationships to the state. Even within a plant or between plants of a single firm there might be considerable differences in the way production was organized. The sheer size of the firm tells us little about its social relations or its place in the structure of the industrial sector.

The last problem relates to the notion of whether we can translate the rise of the corporation ('cause') directly into the transformation of spatial structure ('effect')? Previous writers have claimed that the development of industrial suburbs and satellite cities after 1900 was a direct response to the emergence of new and innovative firms in growth industries. With an uncertain economic milieu, and as firms swapped external economies for capital-intensive technologies and sought to create a new workforce, peripheral land became a haven for installing new technologies. At a theoretical level we need to distinguish between the changes in firms and the changes in industrial spaces, and pose carefully the question of their relationship. Radical restructuring of firms can take place without spatial relocation, while spatial fixedness can be a powerful impetus behind restructuring.¹¹ Locational change is only one of a wide range of choices that a firm can make in response to

¹¹ D. Massey, Spatial Divisions of Labour: Social Structures and the Geography of Production (London: Macmillan, 1984).

economic pressures. Little empirical evidence has been brought forward to justify the view that the consolidation movement at the end of the nineteenth century is itself responsible for the restructuring of urban industrial space.

3.2 Divergent Paths and Production Formats

The revolution in the social mode of production which is the necessary product of the revolution in the means of production is accomplished through a variegated medley of transitional forms. These forms vary according to the extent to which the ... [machine] has become prevalent in one branch of industry or the other, the time during which it has been in operation, the previous condition of the workers, the degree to which manufacture, handicraft or domestic industry preponderates, the level of rent of the workrooms, and so on.¹²

In order to make viable propositions it is necessary to conceive of an object as multi-dimensional. This means that we must not impute effect to any single explanation. Yet, in the literature of the industrial geography of urbanization between 1850 and 1918 this has not been the case. Writers from the Weberian tradition have viewed the geography of industry as a product of rational manufacturers seeking the least-cost location for their firm, while Scott has centred his theory on the transactional features of production deriving from capital accumulation. In attempting to explain changes to urban industrial geography, both streams have given primacy to the technologies associated with the rise of the corporation and the development of new transportation networks at the end of the nineteenth century.

¹² K. Marx, Capital, (New York: Vintage Books, 1977) vol. 1, p. 602.

In order to gain a picture of urban industrial geography which does not collapse into dualisms and does not rely upon an essentialist position with regard to industrial change, a theoretical perspective is necessary that allows us to capture the diverse range of historically-specific industrial structures. Accordingly, I start from a position that emphasizes the range of possibilities and constraints that confront any firm.

Within the broad ambit of the economy each firm faces common problems of industrial organization. Firms have to be linked to ensure that the necessary physical connections are made. Firms have to coordinate groups of workers in order that the smooth functioning of production can take place. Materials, workers, machinery and finances have to be regulated so that the system is economically viable.¹³ Within the context of these similarities, however, there are a number of different productive strategies which firms may employ to ensure success. Not all firms react to external and internal pressures in the same way: they cannot be divided into two sets based on single criterion of scale. They are responding to the interplay of technology, the labour process, and production organization. We can first understand this through the productive strategies that underpin production formats. These strategies are based on two sets of properties: material and social.

By material I mean that firms can be organized by the physical character of the materials that they work with. The marketing, technological and organizational

¹³ R. Walker, "The geographical organization of production-systems", Environment and Planning D, 1988, 6, pp. 381-382.

structures associated with firms with a common material base lead these firms down similar lines of development, while firms with dissimilar physical characteristics face different procedures for organizing production. Firms with the same material base are influenced by the markets in which they compete: both the supply of materials and the demand for the products. The ability to introduce new technologies to transform raw materials varies from industrial sector to industrial sector. The manner in which firms gain access to finance, a specific labour force, and connections to other firms is also determined by their physical character. As I show in Chapters Five and Six, the textile industry was quite different from the printing industry, and the metal from the leather.

There are also marked differences between firms in terms of their social and technological relations of production. Industries, despite common problems of organization and similar material properties, are characterized by a diversity of social and technological properties. Each industry can be divided into branches - for example, the tobacco industry is made up of the cigar, cigarette and tobacco branches - which face unique constraints in terms of the way that workers are organized into teams, the composition of the labour force, the nature of input-output relations, and the degree of mechanization. These differences propel the branches down different paths of development. Branches from one industry may have more in common with some branches from another industry than they do within their own industry. In the nineteenth century, for example, the manufacture of boots and shoes had more in common with other mechanized industries than it did with tanning

which was dependent upon the chemical transformation of hides to leather. The baking of bread had more in common with other handicraft trades than it did with the highly mechanized biscuit industry.

The two vectors of production - material and social properties - are meshed in such a way that they give rise to a wide range of possible production configurations or production formats. Figure 3.1 contrasts two production formats in terms of their technological, labour processes, and organizational features. These two formats represent the 'classical' cases of the small-scale, nineteenth-century, proprietary firm and the corporate firm using mass-production. Between these two extremes, as I will show in this thesis, one can identify a large array of formats as very few firms before 1918 fit into this two-part schema. In the baking industry at the end of the century, the bread baker still laboured in the small (part retail/manufacturing) shop with few mechanical aids, and for a local market. The manufacture of biscuits, in contrast, was undertaken in a situation where unskilled workers working with a wide range of machinery geared to high-volume flows produced brand-name biscuits and crackers for the regional and national markets. Neither bread nor biscuit baking fit into the two 'classical' formats shown in Figure 3.1. The point to be stressed here is that the structure of industry can be broken down into a number of different formats based on different combinations of their material and social properties. The manner in which the notion of formats is used depends upon the type of analysis one is interested in doing. For example, production formats can be utilized with the object of dissecting a particular industry

FIGURE 3.1
THE CLASSIC CASES OF PRODUCTION FORMATS

	Corporate Format	Proprietary Format
Technology		
Process	Continuous	Batch
Machinery	High-volume, single- purpose	Low-volume, multi- purpose
Organization	Integrated	Disintegrated
Capacity	High and fixed	Variable
Investment	High	Low
Labour Process		
Skill content	Low	High
Control	Managerial	Proprietary
Organization		
Raw material	Bulk buying	Lot buying
Finance	External	Internal
Linkages	Few	Multiple
Marketing	Bulk, agents	Batch, jobbers
Products	Homogeneous	Differentiated
Number of workers	Large	Small
Physical structure	Multi-building, fixed	Single-plant, mobile

or all the firms in a city or region.

The wider industrial system is made up of these production formats which are associated with one another through some combination of the following: the nature of the product; input-output relations; marketing strategies; financial arrangements; and reliance on common social and physical infrastructures. To flesh out these ideas, a brief overview of technological change, the labour process and production organization will be presented.

Technological Change

We have seen that many writers place great emphasis upon the role of technology in the development of the large-scale corporation, and that the emergence of new type of corporation since the 1880s has been credited with reshaping urban structure. While this perspective presents a tidy and seemingly rational explanation for the development of industrial and urban change does it really represent a coherent and viable model? During the last decade, a number of writers have openly questioned this interpretation of technology as the propelling agent of economic change.¹⁴ Gertler, for example, in reference to the supposed

¹⁴ Clawson, Bureaucracy and the Labor Process; Gertler, "The limits to flexibility"; N. Rosenberg, Perspectives on Technology (Cambridge: Cambridge University Press, 1976) and Inside the Black Box: Technology and Economics (Cambridge: Cambridge University Press, 1982); Samuel, "The workshop of the world: steam power and hand technology in mid-Victorian Britain", History Workshop, 1977, 3, pp. 6-72; R.A. Sayer, "Industry and space: a sympathetic critique of radical research", Environment and Planning D, 1985, 3, pp. 3-29; P. Scranton, "The workplace, technology, and theory in American labor history", International Labor and Working-Class History, 1989, 35, pp. 3-22; M. Storper and R. Walker, The Capitalist Imperative: Territory, Technology, and Industrial Growth (New York: Blackwell, 1989); R. Walker, "Technological determination and determinism: industrial growth and location" in M. Castells (ed.), High Technology, Space and Society (Beverly Hills, Sage, 1985), pp. 226-264.

emergence of flexible accumulation with its array of flexible technologies as the dominant process of the contemporary economy, has stated that "the path of progress is unsteady, uncertain and fraught with difficulties and false promises".¹⁵ A quick review of these difficulties will indicate the limitations of a model based upon a simplified linear trend in industrial change.

As part of the classic model, it is asserted that new capital-intensive technologies were rapidly taken up by a number of industries and quickly diffused to others. While such examples may be found, much of the increase of productivity in the nineteenth century depended upon the gradual introduction of small changes and incremental improvements to existing products and processes. Rosenberg demonstrates how steam power was introduced in the water and rail transportation sectors more rapidly than in manufacturing, while Hounshell shows that the quest for interchangeable parts by manufacturers in the United States was a slow process characterized by minute adaptations to existing techniques and technology.¹⁶ There is frequently a long time lag between invention and innovation, and between the technical feasibility of an innovation and its widespread diffusion to other industries. Some innovations are never diffused. In the British pin industry, to take one example, manufacturers were unwilling or slow to adopt new machinery that would

¹⁵ Gertler, "The limits to flexibility", p. 423.

¹⁶ Rosenberg, Perspectives on Technology, and Inside the Black Box, pp. 3-23; R. Rothwell and W. Zegveld, Reindustrialization and Technology (London: Longman, 1985); Walker, "Technological determination and determinism". D.A. Hounshell, From the American System to Mass Production, 1800-1932: the Development of Manufacturing Technology in the United States (Baltimore and London: The John Hopkins Press, 1984).

have given them a competitive edge over the machinery used by other employers. Adoption rates varied considerably from one invention to another.¹⁷ Technological change can be restricted to a small part of the entire industrial system as innovations are object- and process-specific. At the same time, the technological choices made circumscribe other options and lead industries down certain paths which restricted the range of options open to them.¹⁸

Despite the web-like character of technological change there are dramatic bursts of growth centred around structural changes to the technological manipulation of nature: technological change does occur in broad fronts. There is a growing literature on the relationship between technological change and long waves of growth, which will be considered in more detail in the following section.¹⁹ These radical shifts in the technological basis of industry come in terms of structural changes within a sector or as leaps of technology based on the natural organization of matter. Industries follow trajectories which can "make possible wholly new or

¹⁷ H.I. Dutton and S.R.H. Jones, "Invention and innovation in the British pin industry, 1790-1850", Business History Review, 1983, 57, pp. 175-193. The British experience contrasts with what occurred in the United States, where pin manufacturers quickly adopted machinery. See Hounshell, From the American System, p. 51.

¹⁸ Walker, "Technological determination and determinism"; M. Storper, "Big structures, small events, and large processes in economic geography", Environment and Planning A, 1988, 20, pp. 165-185.

¹⁹ See C. Freeman (ed.), Long Waves in the World Economy (London: Frances Pinter, 1984) and Design, Innovation, and Long Cycles in Economic Development (New York: St. Martin's Press, 1986); Gordon, Edwards and Reich, Segmented Work; P. Hall, "The geography of the Fifth Kondratieff" in P. Hall and A. Markusen (eds.), Silicon Landscapes (Boston: Allen and Unwin, 1985), pp. 1-19; M. Lamontagne, Business Cycles in Canada (Ottawa: Canadian Institute for Economic Policy, 1984); A. Maddison, Phases of Capitalist Development (Oxford: Oxford University Press, 1982); E. Mandel, Late Capitalism (London: New Left Books, 1975) and Long Waves in Capitalist Development (Cambridge: Cambridge University Press, 1980); J.J. van Duijn, The Long Wave in Economic Life (London: Allen and Unwin, 1983).

drastically improved products and processes".²⁰ Firms and industries are linked in a web of technological connections or complementarities, and their interactions diffuse technological changes from a limited arena of production throughout the economy. "In each case a central innovation, or small number of innovations, provided the basis around which a larger number of further cumulative improvements and complementary inventions were eventually positioned".²¹ Complementarity may occur both within an industry and between industries.²² Because the machine tool industry in the middle of the nineteenth century "dealt with processes and problems common to an increasing number of industries, it played ... the role of a transmission center in the diffusion of the new technology".²³ The development of the sewing-machine industry after 1860 proved to be the basis for dramatic changes in such industries as boots and shoes, clothing, bookbinding and saddlery. Technological change in the chemical industry at the turn of the century had an enormous impact upon the products and processes in the textile, metallurgical, electrical and agricultural products industries.

A central feature of broad fronts of industrial development is that new industries lead in rates of growth, technological innovation, capital investment, segmentation of the production process, and the introduction of new strategies to

²⁰ Rosenberg, Inside the Black Box, p. 75.

²¹ Rosenberg, Inside the Black Box, p. 59. Also see his Perspectives on Technology, chap. 1.

²² Sayer, "Industry and space", pp. 6-9.

²³ Rosenberg, Perspectives on Technology, p. 19.

control labour.²⁴ During any period of growth, a group of industries in acceleration may transmit growth pulses to other industries: the impact of new technologies in leading industries can spill over into others. Thus, in the second half of the nineteenth century a number of industries felt the repercussions of the generalization of 'steam-powered manufacture'. After the 1880s, to deal with the problems associated with the practical realities and inadequacies of steam power, a new set of technological innovations were introduced. The internal combustion engine and electricity came to replace steam power while new hardware and organizing principles were introduced to speed up the operations of machinery invented in the earlier period. This took the form of the diffusion of flow and assembly line techniques.²⁵

Certain firms were more able to profitably exploit new technologies than others. As I noted above, some firms - many of which started off as small concerns - were those in new industries which not only introduced new technological hardware but also conceived of entirely new products that created a ripple effect throughout the production system. Larger firms, on the other hand, which had access to large pools of capital through their connections with capital markets, their strategy of horizontal and vertical integration, and the protection they received from governments (tariffs, patent regulation, bonuses and subsidies), were able to conceive

²⁴ M. Storper, "Technology and spatial production relations, disequilibrium, interindustry relationships and industrial development", in M. Castells (ed.), High Technology, Space and Society (Beverly Hills: Sage, 1985), pp. 265-283.

²⁵ P. Blackburn, R. Coombs and K. Green, Technology, Economic Growth and the Labour Process (London: Macmillan, 1985), chap. 3.

of, implement, and maintain control over new technologies.²⁶ While a wide range of firms were forced to continually update their technology, large as well as smaller firms would not channel capital into new technologies unless it was profitable to do so or was critical to the maintenance of their competitive position.

Despite the diffusion of new technologies the introduction of new machinery and new social relations of production did not proceed smoothly. There were severe limitations and obstacles to the use of technology and its integration into production. Gertler points to the "considerable gap between what new technologies were supposed to be capable of and what they actually achieved" in the contemporary world.²⁷ Rosenberg states that, "on the purely technological level, innovations in their early stages are usually exceedingly ill-adapted to the wide range of more specialised uses to which they are eventually put". The introduction of electricity into manufacturing, for example, was not possible until a further innovation, the steam turbine, made it feasible.²⁸ In the nineteenth century machinery was often unable to produce products of a good quality and at a low price. Raphael Samuel in his majestic study of machinery and labour in nineteenth-century Britain states that there was a "gap between expectation and performance". Machines were subject to serious

²⁶ For a discussion of this in the Canadian context see T. Traves, The State and Enterprise: Canadian Manufacturers and the Federal Government, 1917-1931 (Toronto: University of Toronto Press, 1979), chap. 1. Also see Edwards, Contested Terrain.

²⁷ Gertler, "The limits to flexibility", p. 424.

²⁸ Rosenberg, Inside the Black Box, pp. 111, 77-78. For the problems associated with the introduction of electricity into manufacturing see R. DuBoff, "The introduction of electric power in American manufacturing", Economic History Review, 1967, 20, pp. 509-518.

problems in terms of execution: they often failed to perform the tasks that they were introduced to do; they were beset by continual snags; they could not perform finer work in many lines; and they were usually dependent upon labour to control and guide them.²⁹ In some cases, parts of the production process were extremely difficult to mechanize. In other cases, new technology allowing manufacturers to produce interchangeable parts resulted in higher costs per unit and lower productivity.³⁰

While the introduction of new technologies into large firms may have been difficult, it was often impossible for small firms. Most small firms lacked the technical sophistication and the capital necessary for the introduction of new and risky technology.³¹ In certain industries, machines had to be kept running at all times if fixed and variable costs were to be covered, hence, in many cases, machinery was profitable only if it was geared to high-volume and large-scale production. In a study of eighty small metal working firms in New England between 1890 and 1957, J.H. Soltow found that they obtained investment in a different manner than did large firms. New technologies were often not introduced; instead, to keep costs low, old

²⁹ Samuel, "The workshop of the world", pp. 51-52. Also see Clawson, Bureaucracy and the Labor Process, p. 199.

³⁰ Hounshell, From the American System, pp. 48-49.

³¹ For a discussion of why manufacturers may not introduce new technology see Rosenberg, Inside the Black Box, chap. 5.

machinery was adapted to new products as a way to cut costs.³² Firms and industries functioning in a highly specialized and limited market or a highly seasonal context were also hindered from implementing new technology.³³ Two significant factors influencing the specific trajectories that Montreal's industrial growth took were the small size of the Canadian market and the concentration of industries in Montreal that made products which were highly differentiated by season. These factors forced many manufacturers to undertake various forms of batch production rather than strategies favouring continuous-processing methods.

Lastly, the introduction of new technologies create their own internal contradictions which restrict the viability of the technology. One difficulty with the introduction of technology lies in the necessity to bring about changes in managerial hierarchies and decision-making structures. These changes are not straightforward and can be difficult to implement. Neither management nor labour is willing to concede its position within the old organizational form.³⁴ The result could often be that the productivity expected from the new machines was not realized as employees created a series of barriers to their full installation.³⁵ At the same time,

³² J.H. Soltow, "Origins of small business and the relationship between large and small firms: metal fabricating and machinery making in New England, 1890-1957" in S.W. Bruchey (ed.), Small Business in American Life (New York: Columbia University Press, 1980), pp. 192-211.

³³ Gertler, "The limits to flexibility"; Samuel, "The workshop of the world".

³⁴ Gertler, "The limits to flexibility". The case of the McCormick Reaper Works is a good nineteenth-century example. The huge Chicago firm did not adopt a high-volume, technologically-advanced system of production until 1880 when Leander McCormick, who for thirty years controlled production, was fired. See Hounshell, From the American System, chap. 4.

³⁵ Samuel, "Workshop of the world".

technological change does not necessarily lead to the degradation of skills.³⁶ New machines recreate the skill structure of workers in an industry, and one facet of this can be the reskilling of a portion of the labour force. This reskilling provides the potential for greater control over the labour process by workers. This increased control over production makes the system more vulnerable to resistance on the workfloor and leads to an increasing fragility of the production unit. In the steel industry between 1880 and 1920, for example, the change from batch production to continuous-flow processing was not a simple one where workers became machine minders. Rather, the work force through strategic control over the machines "restricted managerial prerogative over control and coordination".³⁷ In other words, the degree to which management had control over production did not necessarily reside in skills as such, but in the manner in which technology was used by workers.

The effects of technological change upon the economy were extremely diverse. Technology does have an enormous impact upon economic change. At any one time, manufacturers are presented with a range of technological systems with which to make their products. To situate technology as the locus of change within firms and industries is to pare away the difficulties at the shop floor and the relations between firms which engender a much greater variance. For example, the supposed transition to mass production at the end of the nineteenth century was not a simple linear

³⁶ C.R. Littler, The Development of the Labour Process in Capitalist Societies (London: Heinemann, 1982); R. Price, "Theories of labour process formation", Journal of Social History, 1984, Fall, pp. 91-110; S. Wood, The Degradation of Work? (London: Hutchinson, 1982).

³⁷ M. Nuwer, "From batch to flow: production technology and work-force skills in the steel industry, 1880-1920", Technology and Culture, 1988, 29, pp. 808-838.

process. As few firms or industries can be placed in all the categories that make up a particular production paradigm it is "very difficult to identify particular enterprises or industries as instances of mass production or flexible specialisation". Even the car industry, the classic example of mass production, does not readily fall into the narrow slot suggested by the proponents of Fordism.³⁸ Moreover, the transition was a slow and arduous process spanning more than a hundred years, and involving experimentation and changes in many industries.³⁹

The difficulties associated with the implementation and diffusion of new technologies posed severe constraints upon the productive strategies that individual firms and industries could undertake. This was compounded by the technical choices open to manufacturers. The result was that a wide range of production formats emerged. While some industries were able to introduce important innovations on a continuous basis, others were not. Even within an industry, some firms choose new forms of machinery and new ways of linking labour and machines, while others did not. Inter-industrial linkages allowed for the faster and more successful installation of organizing production among some industries than among others. The production formats that can be identified at any one time were partly a result of the obstacles confronted by manufacturers and the choices they made as they sought to provide balance between the demands of competition, control of labour, and technological

³⁸ Williams et al., "The end of mass production?", p. 415. For a discussion of how the technological basis of the United States auto industry had deep roots in nineteenth-century machine tool production see Rosenberg, Perspectives on Technology, pp. 26-28.

³⁹ Hounshell, From the American System.

change. As a form of conceptualization, technological change provides a valuable tool for understanding the trajectories that firms and industries can take. As an conceptualization of the historical specificity of actual changes, however, it must be understood within the wider economic and social context. It is one thing to see major changes in the technological basis of economic practice, it is quite another to make generalizations about the effects of these throughout the entire industrial structure.

Labour Process

Changes in technology are entwined with the restructuring of the labour process. With the publication of Harry Braverman's Labor and Monopoly Capitalism in 1974, there has been a revival in the interest shown in the labour process. The labour process has been seen by some to be an important agent behind the changes to the structure and geography of industry, or even as the most important element of long-term change.⁴⁰ According to Scott, the restructuring of the division of labour was the pivot around which the transactional character of intra- and inter-industry linkages revolved. Similar criticisms as those presented of the primacy of technological change, however, can be made of the priority given to the impact of the labour process in generating change.

For Braverman a new phase of capitalism at the end of the nineteenth century was responsible for the destruction of craft skills as blue-collar jobs were subdivided

⁴⁰ See Gordon et al., Segmented Work and Stone, "The origins of job structures" for changes to industrial structure and D. Perrons, "The role of Ireland in the new international division of labour: a proposed framework for analysis", Regional Studies, 1981, 15, pp. 81-100 for changes to the geography of industry. For a general critique of this approach see Massey, Spatial Divisions of Labour, pp. 22-26.

into more and more specialized tasks fit for machinery. Control of the labour process came to be situated in the hands of a managerial hierarchy. Reviews and critiques of Braverman's work are numerous and it is unnecessary to reiterate them except, as I mentioned above, that the relationship between technological change and the construction of skill is a more complicated process than Braverman is willing to concede.⁴¹ Suffice it to say that post-Braverman studies have attempted to transcend the "universal characteristics of 'labour' as a general category in the production process".⁴² Stemming from this critique there has been a wide range of studies and theoretical programs that have attempted to understand how human agency interacts with the structural limits of capitalist production to produce the labour process. Rather than viewing top down changes to the labour process as the cause of the restructuring of production, these writers have placed the labour process within a wider context where it is only one, albeit important, facet of economic change. The primary concern has been with the resistance set up by workers to changes from employers and managers and how this resistance has shaped the contours of labour process practice.

The major conclusion of these studies has been that the degradation thesis of Braverman is a gross simplification of the diverse and multiple ways that the labour process was structured. Clawson, for example, argues that the restructuring of the

⁴¹ For these see Burawoy, Manufacturing Consent, and The Politics of Production; R. Coombs, "Labour and Monopoly Capital", New Left Review, 1978, 107, pp. 79-96; Littler, The Development of the Labour Process; Price, "Theories of labour process formation"; Wood, The Degradation of Work?.

⁴² Littler, The Development of the Labour Process, p. 27.

labour process and employers' attempts to undermine the relative autonomy of workers were related to the combination of piece work, record keeping, and technological change at the workplace. According to Friedman, the rise of monopoly capitalism has led to increasing working-class resistance to changes to work, and this has led to a diversity of workplace conditions. Thus, changes to industrial structure are not simple linear ones where the restructuring of the labour process produces other effects. As Price states, the labour process "is a structured social process with dimensions that extend beyond the purely economic" and that there is "no monocausal factor to explain labour process formation".⁴³

Despite the construction of a radically different ontological position from the functionalist one of Braverman, those writers have paid little attention to the spatial implications of changes to the labour process. This question will be taken up in more detail in the last section of the chapter. For now we shall review some of the more important factors interacting with technological change in the formation of the labour process.

Like Braverman, those writers see technology as playing an important role in the way that the labour process was structured. New technologies create the possibility for fundamental changes to the labour process. The classic case are the steel mills of the United States and Canada where the development of new technologies and the associated reorganization of work practices after 1880 were in

⁴³ Clawson, Bureaucracy and the Labour Process; A. Friedman, Industry and Labour: Class Struggle at Work and Monopoly Capitalism (London: Verso, 1977); Price, "Theories of labour formation", pp. 106-107.

large measure responsible for the demise of the craft worker, the growth of a semi-skilled workforce, and the development of a fragmented and divided labour process.⁴⁴ As was pointed out in the preceding section, however, many processes were untouched by the new techniques. Factors such as dependence on skilled labour at critical points in production, the character of the product itself, and lack of product demand all militated against fundamental changes in the labour process. The introduction of new technologies was only one feature of this restructuring.

A second factor in the formation of the labour process was the scale and stability of product markets. The extent of the market affects the mass of goods produced and hence the possibility of increasing specialization. The degree to which markets fluctuate determines to what extent a product can be standardized and thus the ability to introduce mass production technologies. The product market determines the application of technology, and the potential for intensifying the division of labour.⁴⁵ Constantly shifting markets such as in the clothing, boot and shoe, and specialized machinery industries generally restricted the manner in which the labour process could be parcelled up. On the other hand, a rapidly growing market could limit the introduction of new technologies and labour practices as shown in the early years of Singer Manufacturing and McCormick Reaper where the difficulties associated with perfecting new machines and integrating them into a

⁴⁴ F.G. Couvares, The Remaking of Pittsburgh: Class and Culture in an Industrializing City (Albany: State University of New York Press, 1984); C. Heron, Working in Steel: the Early Years in Canada, 1883-1935 (Toronto: McClelland and Stewart, 1988).

⁴⁵ Price, "Theories of labour process formation"; Storper and Walker, The Capitalist Imperative, pp. 160-163.

viable production system were inimical to the capture of an expanding and competitive market.⁴⁶

Another factor was the institutionalization of skill in the hands of a select group of workers. Skilled workers were able to maintain some exclusionary control over the labour market.⁴⁷ Canadian printers, for example, "continued to hold considerable power at the workplace - a power that had been maintained despite extensive mechanization, an ever-increasing concentration and centralization of capital, and the ongoing machinations of a far-from-neutral state".⁴⁸ In the tug of war between capital and labour over control of the labour process there was no decisive victor. Although employers introduced new and more sophisticated forms of machinery, and developed methods of cost accounting and systems of incentive pay, their attempts to reorganize production were frequently thwarted and redirected by labour.⁴⁹

There are, thus, different trajectories of change in the formation of the labour process. There is no simple degradation of labour skill but a diversity of ways that labour, technology and other factors interact. This is reflected in continually shifting

⁴⁶ Hounshell, From the American System, chaps. 2 and 4.

⁴⁷ D. Montgomery, The Fall of the House of Labor (Cambridge: Cambridge University Press, 1987); Price, "Theories of labour process formation".

⁴⁸ G. Kealey, "Work control, the labour process, and nineteenth-century Canadian printers" in C. Heron and R. Storey (eds.), On the Job: Confronting the Labour Process in Canada (Kingston and Montreal; McGill and Queen's University Press, 1986), p. 92.

⁴⁹ D. Montgomery, "Whose standards? Workers and the reorganization of production in the United States, 1900-1920" in D. Montgomery, Workers' Control in America (Cambridge: Cambridge University Press, 1979), pp. 113-138.

productive practices at the levels of the workplace, industrial branches and industries. While our understanding of the role that the labour process has played in industrial change has increased dramatically, there has been a tendency to underestimate the physical side of production, and writers have "glossed over the heterogeneity of industries"⁵⁰: there has been too much attention given to the labour process at the expense of the physical side of products, the way that they are introduced and the manner in which they are differentiated. This is not to deny that the labour process was a fundamental locus of struggle and change. The labour process must be seen within the context of other social relations of production.

Production Organization

It has already been mentioned that the organization of production in the nineteenth and early twentieth century has been generally viewed as being polarized between small-scale (batch) and large-scale (mass production) industry.⁵¹ The batch production strategy was chosen because firms had either to escape the effects of fluctuations in business conditions or to protect themselves from competition. It was a strategy more likely to succeed in the consumer goods industry (for example, clothing), and to a lesser extent, in the intermediate goods industry (for example, pig iron), where organizational and technological constraints were obstacles to the emergence of large firms employing mass production techniques. The central concern

⁵⁰ Storper and Walker, The Capitalist Imperative, pp. 50-58.

⁵¹ Lamoreaux, The Great Merger Movement, chap. 2.

was to find a niche within the market and to base production on high margins rather than volume production. This strategy differed greatly from that of mass production even though producers who became large-scale manufacturers were pursuing the same goals as those of mass producers - to defend against competition and to minimize business fluctuations. Mass producers sought to earn profits on volume of output rather than on high margins per unit. To ensure the success of this policy, manufacturers produced large quantities of homogeneous goods to take advantage of efficiencies of volume production and thus reduce unit costs to a minimum. Their strategy depended upon the development of a large market as well as innovations in the production process. In the cigarette industry, for example, the introduction of the Bonsack machine together with the slow demise of the cigar's popularity and an extensive advertising campaign by the leading firms, propelled cigarettes from a virtually unknown commodity before 1880 to the most popular tobacco item by the Depression. By 1900 mass production firms differed from batch production firms in four ways: they utilized more capital-intensive processes; they were more vertically integrated; they needed to run at full capacity; and they minimized product differentiation. The decision of a large firm to restrict product differentiation left a niche, indeed in some cases created new niches, for smaller and more enterprises which could take advantage of the flexibility of batch production. The development of mass production in the cigarette industry under the control of a few firms at the end of the nineteenth century, for example, did not do away with the smaller firms. These small firms quickly found a niche in the industry - the manufacture of high-

grade, cigarettes made from foreign leaf.

The manner in which the choices between batch and mass within the wider economy were worked out, however, led to a wide variety of production configurations. The choice between batch and mass production was affected by perceptions of market opportunities, technological possibilities, and organizational possibilities.⁵² These options were, in turn, conditioned by the general pressures of competition and the search for profits.

There was a juxtaposition of distinct organizational forms between and within industries, and, in some cases, even within a single firm. As Samuel states, the evolution of industry was characterized by "concurrent phases"; he offers the example of the coexistence of steam and hand power in nineteenth-century Britain.⁵³ In Philadelphia between 1850 and 1880, five different work environments have been described ranging from the small artisan shop to the large factory. They were differentiated by the division of labour, the extent of mechanization, and the composition of the labour force.⁵⁴ Another perspective on the varied nature of industrial organization is through 'production-systems'. Despite the division of labour among industrial units, groupings can be discerned in which these units are connected by input-output relations and have a common technological base. Walker

⁵² Storper and Walker, The Capitalist Imperative, p. 158.

⁵³ Samuel, "Workshop of the world".

⁵⁴ B. Laurie and M. Schmitz, "Manufacture and productivity: the making of an industrial base, Philadelphia, 1850-1880" in T. Hershberg (ed.), Philadelphia: Work, Space, Family and Group Experience in the Nineteenth Century (New York: Oxford University Press, 1981), pp. 43-92.

has identified six different production systems: simple commodity, sequential, pyramidal component-assembly, nested, branched, and extended.⁵⁵ The ability of workers in different occupations to face the challenges posed by economic change set the stage for the manner in which different industries dealt with the transition from one industrial stage to another. In a study of the Halifax baking and confectionery industry, Ian McKay shows that this transition could occur in five ways.⁵⁶

Conceptualizing batch and mass production as polar opposites is inadequate for this type of analysis. The Allis-Chalmers Manufacturing Company, for example, was a large firm that until World War I produced a wide range of specialized industrial equipment under batch conditions. In the manufacture of its "big stuff", production "demanded the skills, the customs, and the culture of craft production", and "mass-production techniques were an adjunct to batch production".⁵⁷ The war provided opportunities for the firm to move into mass production, and by the 1930s the firm had a dual industrial structure of batch and mass production where skilled craft workers worked on the specialized large products and less skilled workers were employed in the mass production of the new lines introduced over the preceding decade. The line between batch and mass production and the way that these

⁵⁵ Walker, "The geographical organization of production-systems".

⁵⁶ I. McKay, "Capital and labour in the Halifax baking and confectionery industry during the last half of the nineteenth century", Labour/Le Travailleur, 1978, 3, pp. 63-108.

⁵⁷ S. Meyer, "Technology and the workplace: skilled and production workers at Allis-Chalmers, 1900-1941", Technology and Culture, 1988, 29.

developed is fuzzy indeed.⁵⁸

There is growing empirical evidence that large complex firms employing some form of mass production go much further back in time than has generally been credited.⁵⁹ For example, it has been argued that the restructuring of the 1880s and 1890s and the mergers of the turn of the century were not a 'watershed' that brought about the first massive growth in firm size and the radical transformation of organizational structure leading to mass production.⁶⁰ In the United States after 1850 there was considerable growth in the number of large firms in a diverse range of industries which probably "had to rely upon distant markets. Each must have faced problems of managerial control and supervision, since each employed many hundreds of workers".⁶¹ Small and medium sized firms continued to play an important part in industrial organization.⁶² Functioning according to a different rationale, small and medium size firms blossomed in a fluid and unstable environment, where specialized production, limited markets, and fluctuations in demand were severe constraints to

⁵⁸ See Williams et al., "The end of mass production?" for an extended argument along these lines.

⁵⁹ Hounshell, From the American System.

⁶⁰ J. Atack, "Firm size and industrial structure in the United States during the nineteenth century", Journal of Economic History, 1986, 44, pp. 463-475; Lamoreaux, The Great Merger Movement; A.P. O'Brien, "Factory size, economies of scale, and the great merger wave of 1898-1902", Journal of Economic History, 1988, 48, pp. 639-649.

⁶¹ Atack, "Firm size and industrial structure", p. 468.

⁶² Sabel and Zeitlin, "Historical alternatives to mass production"; P. Scranton, "Beyond anecdotes and aggregates: the pattern of industrial decline in Philadelphia textiles, 1916-1931", Antipode, 1986, 18, pp. 284-310.

the development of mass production techniques.⁶³ Thus, they played a decisive role in the division of labour as they produced luxury and highly specialized goods, exploited marginal labour forces, and catered to markets that large firms were unable or unwilling to serve. They responded more flexibly to changes in products, processes and markets. They could function on the fringes of the industry, supplying specialized products or responding to seasonal growth in demand.⁶⁴

The growing diversity of firms and the increasing disparity in the size of firms generated a fine-grained web of linkages between firms and industries. In the nineteenth century it would be expected that linkages between local firms would be more important than today.⁶⁵ The changes to transportation, in the form of the expansion of the canal system in the early part of the century and the railway network in the second half were critical in lengthening the spatial reach of inter-firm connections.⁶⁶ With the proliferation of productive strategies and the growing geographic extent of markets after 1850, there was a similar growth in the type and number of linkages. Industries dominated by small firms were not the only ones dependent upon linkages for their survival. While large integrated firms were less reliant on linkages, they frequently contracted out work to smaller firms, and were

⁶³ Walker, "The geographical organization of production-systems".

⁶⁴ Soltow, "Origins of small business".

⁶⁵ A.G. Hoare, "Industrial linkage studies" in M. Pacione (ed.), Progress in Industrial Geography (London: Croom Helm, 1985), pp. 40-81.

⁶⁶ D.R. Meyer, "Emergence of the American manufacturing belt: an interpretation", Journal of Historical Geography, 1983, 9, 2, pp. 145-174.

dependent upon intimate relations with merchants, financiers, as well as upon transport facilities. Even today, very few firms are integrated to the degree that they have no need for products from other firms. Indeed such factors as industrial type, degree of standardization, the extent of spinoffs, and the location of ownership play an important part in the volume of linkages between firms.⁶⁷

Mass production and the corresponding organizational changes to the firm have been seen as resulting from the growth of a mass market, but markets were not of a universal type:

the only thing ... [different markets] have in common is the exchange of a commodity ..., for a certain amount of money between contracting parties. Beyond this, just about every other characteristic is 'up for grabs' and subject to the most ingenious variations.⁶⁸

The nineteenth-century American sewing machine industry, for example, was dominated by three companies, each of which pursued different strategies in their approach to technology, labour and markets.⁶⁹ A highly differentiated market had a decisive impact upon the way that industries were organized. The scale of markets - which varied greatly between industries - strongly influenced the amount of goods produced and thus the degree of specialization possible. The stability of markets determined the degree to which product standardization was possible.

⁶⁷ A. Glasmeier, "Factors governing the development of high tech industry agglomerations: a tale of three cities", Regional Studies, 1988, 22, pp. 287-301; M.J. Hagey and E.J. Malecki, "Linkages in high technology industries: a Florida case study", Environment and Planning A, 1986, 18, pp. 1477-1498; Hoare, "Industrial linkage studies".

⁶⁸ Walker, "Technological determination and determinism", p. 388.

⁶⁹ Hounshell, From the American System, chap. 2.

As I mentioned in the previous section, writers have emphasized technological change and the restructuring of the labour process at the expense of the product.⁷⁰ The growth of an industry revolves partly around the way its product can be adapted to changing situations, the way that it is used, and can be substituted for by other products. Because of the different physical qualities of each product, industries will use different production and organizational methods with differing possibilities for mechanization, standardization and rationalization. That is, industries due to the nature of their product trace out different paths of growth. The result was a diversified array of processes in terms of technological innovation, capital investment, labour process strategies, labour force composition, and relationships within and between industries. By this I do not mean to imply that the character of any industry was determined by the nature of the product that it produced. The point is that the strategies available to an industry were, to some degree, limited by the physical properties inherent in the product. The tendencies of a particular industry cannot, therefore be generalized across all industry, and we must aim to understand the material character of the industry and attempt to see how these tendencies are manifest in the real world. If this is acceptable it seriously undermines the notion of a single and linear growth pattern among industries and raises doubts about the conventional understanding of the spatial implications of industrial growth.

I have argued that each of the three dimensions of industrial structure -

⁷⁰ Rosenberg, Inside the Black Box, pp. 3-4; Sayer, "Industry and space", pp. 6-10; Walker, "Technological determination and determinism", pp. 228-231.

technological change, the labour process, and production organization - was characterized by a diversity of outcomes. The manner in which these outcomes intersect gives rise to a range of production formats in which capitalists undertake different productive strategies. Different production strategies characterize the course of industrial change. Firms can take different paths of development which are part of a concurrently evolving array of production formats and productive strategies. These multiple paths and concurrent formats were in existence from as early as the mid-nineteenth century. This casts doubt upon the simple dual character of industrial structure as presented by Scott. The phenomenon of options among production formats raises questions about the rise of the corporation at the end of the nineteenth century as the principal vehicle for economic change, and also has implications for the spatial correlates of industrial change. To base the geographic configuration of North American cities upon a linear sequence of industrial change giving rise to a dualistic model of industrial organization does not do justice to the diverse character of industrial capitalism. The question of the spatial implications of production formats is left to Chapter Four. I now turn to industrial restructuring through time.

3.3 Urban Development, Long Waves of Growth and Localities

The preceding section of this chapter was concerned with identifying and outlining three critical features of industrial production formats. I have assessed these features so as to identify their dynamics with regard to industrial change. This

brings me to the temporal swings of industrial change and their relation to production formats. Production formats and the various strategies that capitalists employ to achieve their ends, are perennially reshaped. Each new round of investment establishes a new set of constraints and possibilities for recreating the technological, labour and organizational framework of industry. Associated with changes to the social relations of production is the restructuring of the spatial relations of production: there are social divisions of labour and spatial divisions of labour. Of particular relevance to this thesis is the idea of the division of urban development into a number of distinct stages over time based upon changes to the social and technological character of the economy. In recent years, the idea that urban development could be understood as occurring in stages, characterized by distinct social relations has become a powerful tool of the political economist. The stage theory of urban development is rooted in the notion of the waves of growth over a period of fifty or more years.

Long waves and urban form

Within the workings of the capitalist economy are a number of different cycles of investment and disinvestment.⁷¹ They range from the short inventory cycle of three to four years nested within the long cycle (or long wave) of forty to sixty years.

⁷¹ J. Bradbury, "Regional and industrial restructuring processes in the new international division of labour", Progress in Human Geography, 1985, 9, pp. 38-63; D. Harvey, The Limits to Capital (Chicago: The University of Chicago Press, 1982); Lamontagne, Business Cycles in Canada; E. Mandel, Marxist Economic Theory (London: Merlin Press, 1962), chap. 11 and Late Capitalism; N. Smith, Uneven Development. Nature, Capital and the Production of Space (Oxford: Basil Blackwell, 1984); van Duijn, The Long Wave in Economic Life.

All such cycles signify a periodic breakdown in the accumulation process. They also share a number of other common features: fluctuations in the rate of profit; a rhythm of boom and bust sandwiching phases of growth and decline; and a periodic devaluation of capital and labour power. While the shorter cycles are important in understanding the movement of the economy, the long wave has especial importance to the discussion here. Radical organizational change in production is associated with long waves of economic change averaging forty to sixty years based on a structural transformation of the social and technological basis of capitalism. The importance of the long wave lies in the fact that it is the shell in which the major transformation of capitalist structures occur. It is the forum through which technological change, the formation of new class relations, and new spatial divisions of labour and production take place.

In recent years the theory of the long wave has been redeveloped in an attempt to explain the frequent restructuring of industry, the reshaping of urban form and the periodic crises that characterize capitalism. Each cycle appears to be characterized by structural homogeneity, or its own distinctive industrial organization, labour process, dominant technologies, class relations, and spatial patterns of labour and production. The transition from one phase of expansion to another is marked by crisis, an intense restructuring of capital and labour, and a reshaping of urban structure.

Long waves have been seen as an important explanatory framework for understanding the long-term implications of the constant restructuring of capital and

labour since the early nineteenth century. While some restructuring is always taking place, it is intensified in periods of crisis. Falling rates of profit and increased class struggle give rise to the tendency for capital, at specific times, to get into a situation of over-production (or over-accumulation) which generates crisis. The restructuring of social and spatial relations of production through crisis provides a respite from the internal contradictions which generated the crisis in the first place. Crises can be overcome in a number of ways such as increasing productivity, introducing new technology, switching devaluation to competitors, and making improvements to transportation and communications networks.

The development of long wave theory has been characterized by two distinct strands: writers following Schumpeter who centre their analysis upon the role of innovations, while Marxist writers like Mandel focus upon the wider capitalist environment. Most long wave studies have, following the work of Schumpeter, placed the role of innovations as the primary factor in the explanation of long waves.⁷² The primary concern of this position is with the importance, role and timing of innovations and how they generate long-term cycles. The work of G. Mensch best exemplifies the importance given to innovations.⁷³ He argues that the clustering of innovations in time is the primary stimulus to economic upswing. In particular, he stresses the role of 'basic' innovations in the creation of leading sectors of the economy which provide the impetus for economic recovery. Other neo-

⁷² This is highlighted in the collections edited by Freeman, Long Waves in the World Economy and Design, Innovation and Long Cycles.

⁷³ G. Mensch, Stalemate in Technology (Cambridge: Ballinger, 1979).

Schumpeterian writers, while agreeing with Mensch's emphasis upon the dominance of innovations, introduce factors such as diffusion of the innovations, life cycles of leading sectors, and the roles of large and small firms in the process of innovation.⁷⁴ Somewhat neglected are the more general implications of industrial and geographical processes operating within the context of long waves and the trigger mechanisms which give rise to the innovations in the first place.

Marxist writers give attention to innovations, but treat them as consequences of structural changes. We find two major variants, represented by Mandel and Gordon et al. Mandel situates long waves in the dynamics of class struggle and competition, with the movement of the rate of profit as the central component in the explanatory framework. Hence, innovation, changing interest rates, internal reorganization within the firm and other facets of change are not causes, but are the consequences of structural changes associated with the long wave. Mandel, for example, emphasizes technical change in the capital goods sector as the critical factor in long-term economic development. Capital formation and the revolution of technology in this sector provides the stimulus for an upswing which in turn leads to the transformation of the entire economic system. The trigger mechanisms are extraeconomic factors such as revolution, wars and class struggle which unleash the dynamic processes inherent in capitalism. Accordingly, the development of "Late

⁷⁴ J. Clarke, C. Freeman and L. Soete, "Long waves, inventions and innovations" in Freeman (ed.), Long Waves in the World Economy, pp. 63-77; C. Freeman, J. Clark and L. Soete, Unemployment and Technical Innovation (London: Frances Pinter, 1982); R. Rothwell, "The role of small firms in the emergence of new technologies" in Freeman (ed.), Design, Innovation and Long Waves, pp. 231-248; van Duijn, The Long Wave in Economic Life and "Fluctuations in innovations over time" in Freeman (ed.), Long Waves and the World Economy, pp. 19-30.

Capitalism" after 1940, for example, was built upon the defeat of the international working class, the development of automation, and the subsequent increase in the rate of profit.⁷⁵

Gordon et al. and Weisskopf give greater importance to what they call respectively, changes in "social structures of accumulation" and "institutional structures", rather than to technological change.⁷⁶ Within these structures no single mechanism is seen to account for the transformation and development of new capitalist relations. For example, social structures of accumulation are composed of a wide range of institutions that are external to the firm and internal to the macro-economic dynamics of the economy. If these institutions are stable and function smoothly, investment is likely to expand; if not, investment will decline and, after a while, crisis will appear. A crisis is not only rooted directly in the production process, but may emerge from any of the institutions which are necessary to the smooth running of accumulation. A crisis in production and the institutional framework generates, through restructuring, the rise of a new social structure of accumulation which is historically contingent upon the specific nature of the crisis and its class relations.

Drawing on the notion of successive epochs, each characterized by distinct economic, political and social relations, the notion of long cycles of change became

⁷⁵ Mandel, Late Capitalism and Long Waves in Capitalist Development.

⁷⁶ Social structures of accumulation are developed by Gordon et al., Segmented Work and institutional structures are put forward by T. Weisskopf, "The current economic crisis in historical perspective", Socialist Review, 1981, 11, pp. 9-53.

a powerful device for comprehending urban development. One of the earliest calls for a division of urban history into epochs was made by John Borchert in 1967 who claimed that, "a structured urban history of the country or of its major regions, which would help to bring order to the mixture of historical-locational forces that generate the urban landscape, has not yet appeared".⁷⁷ Borchert devised his own stage theory of urban development based upon changes in transportation technologies. This approach has had an important influence upon other writers' interpretations of urban change.⁷⁸ By the mid 1970s political economists were moving away from a position which placed transportation innovations as the dominant force behind the extension and the restructuring of the urban fabric, and were arguing that urban change should be seen in the context of the social relations of production which in turn are associated with long waves of change. In the following years, the relationship between urbanization and the impact of the long-term effects of capitalist development became more clearly delineated, so that by the 1980s, acceptance of an urban stage theory had become widespread.⁷⁹

⁷⁷ J. Borchert, "American metropolitan evolution", Geographical Review, 1967, 62, p. 301. Borchert went on to construct his own scheme, but as it was centred around the development of one set of innovations it was of limited value.

⁷⁸ For example, see P.O. Muller, Contemporary Suburban America (Englewood Cliffs: Prentice-Hall, 1981).

⁷⁹ The wide-spread acceptance of urban stage theory can be noted through the appearance of stages of growth in such text books as D.R. Goldfield and B.A. Brownell, Urban America: From Downtown to No Town (Boston: Houghton Mifflin, 1979) and M. Yeates and B. Garner, The North American City (San Francisco: Harper and Row, 1980). A recent overview of North American urban growth by a historical geographer places this growth into a series of stages. See E.K. Muller, "From waterfront to metropolitan region: the geographical development of American cities" in H. Gillette, jr. and Z.L. Miller (eds.), American Urbanism: a Historiographic Review (Westport: Greenwood Press, 1987), pp. 105-133.

The underlying premise of this relationship according to the political economy position is that there are "invariant laws" of capitalist development which transform the structure and form of urbanization. Writers of the political economy stream argue that these laws are manifested in a constellation of forces - such as technology, growth industries, and class conflict - which take distinct forms, or stages, over time. Each writer has their own dating and names for the stages. I have taken Richard Walker's system where from the late eighteenth century, urbanization in North America has passed through four stages: the mercantile city (1780-1840); the industrial (1840-1890); early corporate (1890-1940); and advanced corporate (1940-1990).⁸⁰ Stages are based on a shift from one sub-mode of production to another, the emergence of a new stage out of the crisis of the old, and the coexistence of past forms with the newer forms. The contradictions inherent in the forces giving rise to one stage, generate a new stage. In the second half of the nineteenth century, for example, the industrial city emerged out of the chrysalis of the mercantile city. It was characterized by steampower technology, the rapid growth of the railway and steel industries, and the small-scale, family firm.

Associated with the development of new urban forms in each of the stages were changes to the internal structure of space. It was argued that each stage is associated with a particular social and economic geography. The shift from the mercantile to the industrial city, for example, was composed of four critical features: concentration of economic activities in the city core; suburbanization of the upper

⁸⁰ "A theory of suburbanization", p. 406.

and middle classes; expansion of centrally-located working-class residential areas; and an increasing degree of the specialization of urban spaces. With the development of new technologies and new growth industries at the end of the century, the industrial city would give way to the corporate city and a new urban geography, characterized by the suburbanization of industry. Recent work on contemporary urban change argues that a new stage is in the making where "flexible spaces" are the pre-dominant spatial form through which industry will locate.⁸¹

Long waves and localities

Does this generalized picture of urban development, however, represent a meaningful picture of the North American city in the second half of the nineteenth century? In order to answer this question it is necessary to examine the notion of the long wave in more detail. I will show that although the long wave has value for understanding urban change, it suffers from an inability to identify the connections between its broad generalizations and the concrete specifics of place. These connections can be made more specific through the notion of localities.

The usefulness of the application of long waves is a difficult task of negotiating between large-scale movements and intensive research at the level of industries or regions. The nature of this problem can be grasped through a short discussion of two of the central features of long waves: the relationship between

⁸¹ Walker, "The transformation of urban structure"; A.J. Scott, "Flexible production systems and regional development: the rise of new industrial spaces in North America and western Europe", International Journal of Urban and Regional Research, 1988, 12, 2, pp. 171-186.

technology and the labour process, and the development of leading sectors. Long waves, both the neo-Schumpeterians and Marxists agree, are associated with a transformation of the technological basis of capitalism and a concomitant reorganization of the labour process. In each long wave certain industrial sectors lead in terms of technological innovation, profit rates and employment growth. Over time, technological changes occurring in leading sectors become generalized throughout the economy and lead to the reconstitution of labour's relationship to mechanization. Gordon et al., for example, argue that there are specific forms of labour processes which parallel technological change, each of which were forged at times of crisis and experienced "a life-cycle conditioned by the rhythm of the ... long swing".⁸²

The relationship between long waves and the ebb and flow of changes to technology, the labour process and industries provide an entry point for interpreting long-term change. Little attention has been paid, however, to the manner in which the mechanisms connecting the abstractions of long wave theory to the particularities of specific places can be discerned. Just how macro-economic indicators such as unemployment rates, industrial output and profit rates are linked to events at different scales such as the closing of a factory, the decline of inner cities, or the deindustrialization of regions is not clear. An example of this is the attempt by Soja et al. to understand the restructuring of Los Angeles within the context of Mandel's long wave theory. They are unable to transcend the fuzziness associated with the connections between long waves and place. They make few substantive links between

⁸² Gordon et al., Segmented Work, p. 15.

the long wave and the restructuring of the Los Angeles landscape. We are not told how it is that long waves intersect with changes to capital, labour and urban space that they present in their empirical section. In fact, their analysis is based, almost entirely, on the concept of restructuring which certainly pays no single allegiance to long waves.⁸³ An obvious way to grasp the relationship between long cycles of growth, and economic and social change in specific locales lies in disaggregation. As the common forces of capitalist production establish different sets of possibilities and constraints upon each industry's marketing, production techniques and organization, it is not possible to make generalized statements concerning the overall impact of long-term change. The disaggregation of the forces powering industrial change may enable us to capture the detailed dimensions of the labour market, the workplace, sectors, and the reproduction of labour power in specific communities. The connections between these can be illuminated through an examination of the internal divisions in the labour market, conflict at the workplace, and the different pathways that industries take. In short, the dominant role of technology that underlies long wave theory needs to be muted by consideration of other social relations. The gap that needs to be filled is the specific ways that the links between these general changes and particular sectors, industries, and firms are forged. Some examples of this include the different forms that restructuring can take⁸⁴, the differential effect

⁸³ "Urban restructuring: an analysis of social and spatial change in Los Angeles", Economic Geography, 1983, 59, pp. 195-230.

⁸⁴ J. Bradbury, "Technical change and the restructuring of the North American steel industry" in K. Chapman and G. Humphreys (eds.), Technical Change and Industrial Policy (Oxford: Basil Blackwell, 1987), pp. 157-173; J. Holmes, "Industrial reorganization, capital restructuring and locational change: an

of leading sectors upon regions⁸⁵, and the distinct ways that industries can develop in different countries.⁸⁶ What I propose to do in this study is to relate global ups and downs of capital accumulation to local or "micro" processes of adaptation in one city. I will consider a period, 1850-1918, which Mandel would treat as one and a half cycles.

Most studies of long-term restructuring are flawed by the neglect of space. In the few studies that do contemplate the spatial realm, the search for large-scale spatial generalizations has inhibited the identification of the local impact of these processes empirically. Neither Lamontagne's study of the postwar long wave in Canada nor van Duijn's international analysis of the long wave after 1945, for example, examine the spatial implications.⁸⁷ Others have given only a minor part to space in their treatment of structural changes such as the collapse of the global

analysis of the Canadian automobile industry in the 1960s", Economic Geography, 1983, 59, pp. 251-271; D. Massey and R. Meegan, The Anatomy of Job Loss: the How, Where and Why of Employment Decline (London: Methuen, 1982).

⁸⁵ B. Harrison, "Regional restructuring and "good business climates": the economic transformation of New England since World War II" in Sawers and Tabb (eds.), Sunbelt and Snowbelt, pp. 48-96; R. Hudson, "Capital accumulation and regional problems: a study of North East England, 1945 to 1986" in F.E.I. Hamilton and G.J.R. Linge (eds.), Regional Economic and Industrial Systems (Chichester: Wiley, 1983), pp. 75-101; Lancaster Regionalism Group, Localities, Class and Gender (London: Pion, 1985); N. Rogers, "Industrial decline, restructuring and relocation: Aston and the Great Victorian Depression" in J. Anderson, S. Duncan and R. Hudson (eds.), Redundant Spaces in Cities and Regions (London: Academic Press, 1983), pp. 99-126; A. Saxenian, "The urban contradictions of Silicon Valley: regional growth and the restructuring of the semiconductor industry" in Sawers and Tabb (eds.), Sunbelt and Snowbelt, pp. 163-197; R.A. Sayer and K. Morgan, "A modern industry in a declining region: links between method, theory and politics" in D. Massey and R. Meegan (eds.), Politics and Method (London: Methuen, 1985), pp. 147-168.

⁸⁶ B. Elbaum and F. Wilkinson, "Industrial relations and uneven development: a comparative study of the American and British steel industries", Cambridge Journal of Economics, 1979, 3, pp. 275-303.

⁸⁷ Lamontagne, Business Cycles in Canada; van Duijn, The Long Wave in Economic Life.

monetary system, the transfer of technology, the transition of technological leadership between countries, and the restructuring of the international division of labour.⁸⁸ The role of urban space in the long wave literature has also been neglected.

Lacking a spatial analysis some writers have made extraordinary leaps of logic. An example of this is David Gordon's analysis of the decentralization of industry from the urban core to the suburbs at the end of the nineteenth century.⁸⁹ The internal contradictions of steam-based growth associated with the long wave starting in the 1840s generated the crisis of the 1890s. One of the strategies employed by firms was to implement new technologies, new labour processes, and new modes of hierarchical control. According to Gordon this led to intense class conflict which forced managers to seek suburban sites far away from the centres of class turbulence. This conclusion is a logical extension of his understanding of the relationship between economic change, long waves and space, but it is an inadequate explanation of the formation of industrial districts, as we shall see in the cases of the Lachine canal and Saint-Henri. Perceptions of a linear connection between long-term shifts and class struggle thwart our understanding of the complex sets of paths industries and cities follow. For any city this would mean an analysis of the development of industry and the labour force, the evolving patterns of land development and transportation facilities, the role of the local state and so forth. None of which are

⁸⁸ See articles by L. Corona, G. Dosi, C. Perez, L. Soete and I. Yamauchi in C. Freeman (ed.) Design, Innovation and Long Cycles, as well as Mandel's Late Capitalism.

⁸⁹ Gordon, "Capitalist development and the history of American cities".

uncontested consequences of simple connections between capital and labour.

In recent years a few writers have attempted to integrate the production of urban space and long wave theory.⁹⁰ Their basic argument is that emerging from each crisis, is a new round of accumulation which involves major changes in the spatial organization of capital, and, as a result, "altered landscapes which define an historical sequence of restructured capitalist spatialities".⁹¹ Regions and cities are restructured in order to restore their potential for capital accumulation, by increasing the rate of profit, opening up new markets and sources of raw materials, exerting greater control over labour, and exploiting new technologies. As a result, some regions and cities decline while others prosper. Examples include Sunbelt and Snowbelt cities in the United States, the development of Central Canada at the expense of peripheral regions, and the North/South divide in the United Kingdom. Restructuring of the international economy is associated with the reorganization of the international system of cities.⁹² Richard Walker in his periodization of American urban development, has made the most consistent argument that the long wave provokes a spatial reorganization of the city.⁹³ Especially important are waves of

⁹⁰ Soja, "Regions in context: spatiality, periodicity, and the historical geography of the regional question", Environment and Planning D, 1985, 3, pp. 175-190; Walker, "A theory of suburbanization".

⁹¹ Soja, "Regions in context", p. 183.

⁹² R.B. Cohen, "The new international division of labour, multinational corporations and urban hierarchy" in Dear and Scott (eds.), Urbanization and Urban Planning, pp. 287-315.

⁹³ Walker, "A theory of suburbanization" and "The transformation of urban structure". Also see Gordon, "Capitalist development and the history of American cities"; R. Hill, "Capital accumulation and urbanization in the United States", Comparative Urban Research, 1975, 4, pp. 39-60; Soja et al., "Urban restructuring".

investment in fixed capital and the built environment which 'fix' the direction and type of change for the duration of the cycle.⁹⁴

While these papers provide a frame of analysis for the relationship between long-term restructuring and urban development, their very broad conclusions now need to be tempered with empirically-based studies of individual localities. The question of the role of economic change in urban development has come to a head in the recent debate over locality research. An acrimonious exchange has arisen over the suitability and relevance of this research which has, in many ways, obscured its merits. Locality studies, especially in Britain, have charted the impact of economic change in communities.⁹⁵ In the eyes of locality researchers more concrete and specific studies are necessary if the relationship between general processes and their impact at the level of everyday experience is to be elucidated. Thus the aim of the book edited by Philip Cooke "is to examine the extent to which localities can act as a viable base for social mobilization and exert influence upon outside forces which help shape their destiny".⁹⁶ The concern is with the inter-relationships which exist between wider processes of economic, social and political change and local events. At the heart of the locality notion is the idea that places are not simply a reflection

⁹⁴ This is very similar in conception to Massey's "rounds of investment". Massey, however, does not link these changes to long waves. See Spatial Divisions of Labour.

⁹⁵ For example see P. Cooke (ed.), Localities: the Changing Face of Urban Britain (London: Unwin Hyman, 1989); Lancaster Regionalism Group, Localities; J. Urry, "Locality research: the case of Lancaster", Regional Studies, 1981, 20, pp. 233-242 and "Society, space and locality", Environment and Planning D, 1987, 5, pp. 435-444.

⁹⁶ Cooke, Localities, p. 3.

of macro-economic restructuring nor sites for spatial variation, but are socially constructed entities which shape and define these wider processes through actions inherent in local practices. Furthermore, the notion of locality does not refer just to the empirical and concrete, but is also helps explain change.

In recent years, however, several writers have questioned the claims of locality research.⁹⁷ The emphasis upon seeking the two-way relationship between economic change and localities has been assailed, as one writer explains, for "subverting ... the over-riding imperative of elucidating the current transition within the generality and logic of capitalism's historical and evolutionary totality".⁹⁸ Critics of locality studies have argued that the focus upon local processes has been done at the expense of wider economic forces. This has led some writers to fear that these studies could be a descent into a contingent-based, uni-dimensional and idiographic exercise susceptible to "the pitfalls of empiricism".⁹⁹ It is also argued that the totality of capitalist development is more than the sum of its parts: studies of, say, even hundreds of British cities and towns do not add up to the British social formation.

Locality research has also been criticized because it has tended to confuse the objects under study. It is not clear whether the Changing Urban and Regional

⁹⁷ S. Duncan and M. Savage, "Space, scale and locality", *Antipode*, 1989, 21, pp. 179-206; N. Gregson, "The CURS initiative: some further comments", *Antipode*, 1987, 19, pp. 364-370; A. Jonas, "A new regional geography of localities", *Area*, 1988, 20, pp. 101-110; N. Smith, "Dangers of the empirical turn: some comments on the CURS initiative", *Antipode*, 1987, 19, pp. 59-68.

⁹⁸ R. Martin, "The reorganisation of regional theory: alternative perspectives on the changing capitalist space economy", *Geoforum*, 1989, 20, p. 189.

⁹⁹ Smith, "Dangers of the empirical turn", p. 63.

Systems (CURS) project is concentrating its energies upon economic restructuring in general or upon restructuring in local labour markets, or practices in local areas. The problem seems to be that the CURS programme has been formulated without doing the primary theoretical work needed to fuse the notions of restructuring and locality. Thus there is a failure to specific social processes to localities and an inadequate drawing up of spatial boundaries.¹⁰⁰ Furthermore, the term locality has been used in a multitude of ways causing a great deal of confusion.¹⁰¹ This multiplicity of meaning has been cited as a reason why the notion of locality is not a valid one for understanding the geographical organization of phenomena.

Are these arguments railing against locality research anything more than structuralist Marxists' discontent with placing agency alongside structure, and space alongside the social? After years in which neoclassical and behavioural theories and their offshoots have dominated industrial and social geography it is quite understandable that there would be a fear that the turn to locality research was a retreat into a theoretically uninformed, empiricist, and idiographic series of case studies which do not point to the wider processes of change. In response, locality researchers have argued that only detailed and specific studies, which meld the specifics of place to the more general processes of restructuring, can illuminate local conditions and verify the validity of more generalized processes. They argue that locality studies are not by nature empiricist and are not "necessarily debarred from

¹⁰⁰ Gregson, "The CURS initiative"; Duncan and Savage, "Space, scale and locality".

¹⁰¹ Duncan and Savage, "Space, scale and locality", pp. 192-194; Urry, "Society, space and locality", pp. 441-443.

generating or corroborating propositions of greater generality or at higher levels of abstraction".¹⁰² This is the crux of the matter. It is critical that processes specific to localities are not separated from structural processes at larger spatial levels. The difficulty lies in according a degree of determination to localities without allowing them to over-generalize the wider forces.

K. Cox and A. Mair suggest that one way to solve the dualism between locality and contingent on the one hand, and global and necessary on the other is through "the recognition and adoption of different levels of abstraction" in localities. An abstract understanding of locality is possible: that is, locality should not be equated with the concrete and the specific alone. They suggest that localities have their own necessary relations through "socio-spatial structures of immobility" and geographical limitations of place. The way that locality can be understood abstractly is through their concept of local dependence. Localities take on their own meaning within an abstracted conception of capitalist social relations in combination with empirical studies.¹⁰³ Another way to illuminate the relationship between localities and the wider political economy is through an examination of the intersections between, on the one hand, regional divisions of labour and business cycles, and on

¹⁰² A. Warde, "Recipes for pudding: a comment on locality", Antipode, 1989, 21, p. 276.

¹⁰³ Cox and Mair, "Locality and community in the politics of local economic development", Annals of the Association of American Geographers, 1988, 78, pp. 307-325; "Levels of abstraction in locality studies", Antipode, 1989, 21, pp. 121-132 and "Urban growth machines and the politics of local economic development", International Journal of Urban and Regional Research, 1989, 13, pp. 137-146. A similar view has been put forward by Harvey in Limits to Capital, pp. 419-421.

the other, the reproduction of everyday life.¹⁰⁴ Broad notions of uneven development, the labour process and technological change are continually being reconstituted through the social reproduction of everyday existence. Localities are forever being buffeted by the perpetual movement of wider structural forces which both shape and are shaped by social action at the local level.

For a understanding of urban development how can we get around the quandary that this debate reflects? Does the debate circumscribe the problems associated with both conventional and marxist long wave analysis of urban and industrial change? Can we theorize place in such a way that it adds to our comprehension of industrial change? Locality studies in themselves cannot present a coherent explanation for the general processes of capitalist development. In this Smith is correct. It would be unwarranted, however, to believe that they cannot provide both a theoretical and empirical basis for understanding capitalist restructuring at the local level and that this could not be incorporated into the more general notion of long waves. To successfully conduct research, locality studies need to construct abstractions which provide place with its own autonomy within the wider processes of structural change. Urban areas cannot be viewed simply as smaller scale versions of processes operating at a global scale. The importance of studying Liverpool and Cheltenham lies in the fact that the specificities of these places filter global processes differently and that the actions of people within cities can 'feed-

¹⁰⁴ B. Warf, "The resurrection of local uniqueness" in R.G. Golledge, H. Courcelis and P. Gould (eds.), The Search for Common Ground (Goleta: Santa Barbara Geographical Press, 1988), pp. 51-62.

back' on the wider forces. Moreover, the form these specific differences take are mediated by more than the uneven development of industry, but are constituted of other critical dynamics. By viewing locality as a heuristic device for describing and explaining class mobilization, the remaking of the urban physical fabric, and the the reproduction of labour power at the local level within the context of structural processes of long waves, it is possible to take some steps to a better understanding of urban and industrial change.

One such example is the study by Nick Rogers of the Birmingham suburb of Aston at the end of the nineteenth century which he situates industrial decentralization at both the international level (restructuring within the context of the Great Depression) and the local (internal and external to the workplace).¹⁰⁵ The interplay between wider structural forces and the qualities specific to the local can provide important insights into the relationship between social and economic changes and spatial development. What must be remembered is that the local is not a simple reflection nor derived from these structural forces. As Murgatroyd and Urry state:

although as a whole the United Kingdom has experienced "deindustrialization" in recent years, this in fact results from highly diverse processes, affecting different localities in different ways depending upon their location within preexisting and new forms of the spatial division of labour.¹⁰⁶

In other words, to understand the impact of long-term spatial changes in the

¹⁰⁵ N. Rogers, "Industrial decline, restructuring and relocation", pp. 99-126.

¹⁰⁶ L. Murgatroyd and J. Urry, "The class and gender restructuring of the Lancaster economy, 1950-1980" in Lancaster Regionalism Group, Localities, pp. 30-53.

organization of labour and capital, as indicated by long waves, it is necessary to delve into the more specific processes which affect the places that constitute the social formation.

There is a wide range of ways to uncover the connections between long waves and urban development. In this study, I will look at two. First, I will examine the trajectory of industrial change in Montreal through an analysis of the connections between long waves of economic change and the local restructuring of technology, the labour process and organizational change. Second, I will investigate the construction of the built environment of the city with particular attention to the formation of local alliances, land development practices, housing markets, and the role of the state in response to short-term business and construction cycles.

I have suggested that the long wave is a macro-economic concept which provides some clues to long-term economic growth through the provision of conceptual tools for understanding change in a dynamic and historical framework. It is especially useful in terms of technological change, the development of new industries, and the development of the labour process. It also has some important implications for our understanding of urban growth. It suggests that the spatial restructuring of urban areas may take place within waves of fifty years or so: that is, there are fundamental realignments of the organizational structure of the city as a result of the development of broad fronts of growth associated with changes to technology, industries and the labour process. These broad fronts, however, are not transposed onto a featureless and passive plain. The history and past geography of

a place are critical obstacles to the implantation of new technological and organizational forms. The urban landscape is a parchment on which social relations are rewritten in each long wave, overwriting, but not erasing, the traces of the social relations of the past. A successful city contains the tensions between the old and the new while it moulds the built environment to the exigencies of the present.

Modern studies of the segmentation of labour markets, the evolution of "Late Capitalism", and the attempt to periodize urban history have provided insights into the long-term and large-scale developments associated with industrial and geographical processes. It has been argued that these processes can be better understood through identifying the mechanisms which illuminate the relationships between long waves of economic growth and the making of place. But the macro-economic theories of technological change and long waves do not explain the highly diverse processes which generate the uniqueness of place and industry. There is, therefore, a need for studies of specific industries and sectors, cities and regions. An analysis of the processes operating at the levels of localities and industries within the context of long-term historical tendencies can provide a sharper and more lucid picture of industrial and geographical change. In the next chapter I explore some of the mechanisms which link long-term changes to the making of urban industrial districts.

CHAPTER 4 THE FORMATION OF INDUSTRIAL DISTRICTS

4.1 Introduction

The progressive manufacturer requires certain things in the district where he is about to locate a factory ... he wants a district where the city and the industrial enterprise can jointly install those special facilities which give one city advantages over others.¹

One element of the history of industrial capitalism in Montreal has been the actions of "progressive manufacturers" and the city which, functioning within the constraints of wider economic structures, were responsible for the creation of a succession of industrial districts. Within a few years in the mid-nineteenth century, the western periphery of Montreal alongside the Lachine Canal, two kilometres from the city core, became the home of most of the largest and most technologically advanced firms in the city. The attractions - cheap water power, access to a major waterway and the port, land with no past industrial history, and access to a variegated labour force - provided advantages that few industrialists of the time could ignore. It was not one factor alone that induced manufacturers to set up their operations alongside the banks of the canal; it was the coalescing of several 'locational factors' into an impressive assemblage that was critical to the construction of this area into an industrial district. By 1860 the canal district was the industrial power-house of the city. Over the next fifty years similar events occurred in other parts of the city. By the 1880s, the western extension of the Lachine Canal,

¹ W.J. Donald, "Zoning scheme builds up property values", Contract Record and Engineering Review, December 15, 1920, p. 1189.

now four kilometres from the city centre, which passed through the suburbs of Saint-Henri and Saint-Cunégonde had mushroomed into an important industrial district specializing in firms which employed high-volume techniques and workers of low skills. In the first two decades of the twentieth century the location of Montreal's boot and shoe firms became divided between those remaining in the city core and those locating in the newly created suburb of Maisonneuve, six kilometres to the east. The creation of a new boot and shoe district was associated with the technological and organizational changes taking place in the industry. But it was more than this. The central core continued to be a magnet for shoe firms. In Maisonneuve, "progressive manufacturers" along with an active set of land developers and a pliant local council created an economic environment that was extremely attractive to a number of industries, one of them being boot and shoe.² This example illustrates the development of a new set of productive relations and spaces, not only in the boot and shoe industry but also in Montreal's economy in general. In the early twentieth century the western and eastern fringes of the city became the home of the large-scale locomotive shops which were among the first industrial establishments in Montreal to employ scientific managerial methods.

By World War I, Montreal had experienced several waves of industrial growth. Each wave was associated with the construction of new industrial districts and a new set of industrial organizational features; the spatial coordinates of

² As I show in Chapter 6.5 the reasons underlying Maisonneuve's attractiveness ranged from tax exemptions to the existence of a large working-class population.

Montreal were realigned as cycles of industrial growth swept through the city (Figure 4.1). Each such district constituted a new set of productive spaces and allowed for the emplacement of a new set of productive social relations. The phenomenon was not unique to Montreal. In the Canton district of Baltimore in the 1850s, at Pullman south of Chicago in the 1880s, and in the resource-based industrial districts south of Los Angeles at the turn of the century, non-central industrial districts have been described as new and important features of the urban landscape.³ The fact that all of them were situated outside the city centre, calls into question the standard model of the historical evolution of urban industrial geography where before World War I industry was clustered in the city core and after the war large-scale firms moved out to the suburbs. I will show here that the polarization of urban industrial geography between two opposing forces - centralization and decentralization - after the turn of the century is a misleading conception of the internal industrial structure of the city. As was shown in Chapter Two, the original classical formulations of this dualism have been made more sophisticated by writers such as Scott but the latter's underlying argument remains the same: firms are either pulled to the core or to the periphery. By recasting the question within the context of the arguments presented in Chapter Three it is possible to gain a better appreciation of the forces creating urban industrial structure.

³ E.K. Muller and P.A. Groves, "The emergence of industrial districts in mid-nineteenth century Baltimore", Geographical Review, 1979, 69, pp. 159-178; S. Buder, Pullman: an Experiment in Industrial Order and Community Planning, 1880-1930 (New York: Oxford University Press, 1967); F.W. Viche, "Black gold suburbs: the influence of the extractive industry on the suburbanization of Los Angeles, 1890-1930", Journal of Urban History, 1981, 8, pp. 3-26.

CHART 4.1
INVESTMENT CYCLES IN MONTREAL, 1848-1914

Trough to Trough	New Industrial District	Growth Sectors	New Features of Industrial Organization	Origins of Labour Force
1848-1873	Lachine Canal St-Antoine	Metal Milling Shoe Clothing	Steam & Hydraulic Power Untransformed Labour Mechanization British Capital (Portfolio) Competitive Capitalism U.S. markets	Irish and British and American Immigrants French-Canadian Migrants
1873-1893	St-Henri Ste-Cunégonde	Metal Textile Clothing Tobacco	Tariff Protection U.S. investment (direct) Steam engines	British French-Canadian
1893-1914	Maisonneuve St-Lawrence	Chemical Electric Paper	Electric Power Taylorism Finance Capital	French-Canadian Italians and Jewish

The purpose of this chapter is to present a perspective upon the formation of urban industrial space which seeks an answer to a simple question: how can we account for the formation of new urban industrial districts? I will start with a review of some critical features of industrial spaces (4.2). This is followed a discussion which draws out the implications of divergent productive practices and waves of growth (4.3) and the construction of the built environment for industrial districts (4.4).

4.2 Industrial Districts

[N]ew and large-scale manufacturing activities formed the basis of emerging, separate industrial districts that were distinguished from one another by type of product, organization of production, power source, or composition of labor force. Such locational specialization at mid century resulted in districts of distinctly different industrial employment opportunities.⁴

According to Muller and Groves, mid-nineteenth century Baltimore was characterized by a set of industrial districts that were non-central and differed from each other in critical ways. Indeed, the history of the North American city appears to be characterized by a succession of new industrial sites and districts. How can we account for this? In Chapter Two it was stated that many commentators on the development of urban areas have stressed the importance of economies of agglomeration and technological innovations to the rupture of urban industrial space. To understand the dynamics behind the restructuring of the industrial landscape requires a different perspective.

⁴ Muller and Groves, "The emergence of industrial districts", p. 160.

One such perspective is through an examination of urban industrial space which emphasizes three aspects of the building of industrial districts: production organization, cyclical growth, and built form. First, it should be noted that industrial districts are a built environment. The construction of the Lachine Canal district after the middle of the century involved building a complex of productive and reproductive institutions such as the miles of grey, stone canal walls that ended at the city harbour; the tracks of the Grand Trunk Railway that snaked through rows of working-class homes; the tramway line that passed along the commercial streets and connected the district to the financial and retailing hub of the city; the roofs of the sugar and rolling mills competing with the spires of the Catholic and Protestant churches; and service and control institutions such as doctors' surgeries and police stations.

This concrete form of industrial spaces, at one and the same time, is created by and gives rise to a particular set of social relations in space. Industrial districts are an expression of unequal power relations of class, ethnicity and gender, while they are created and maintained through interlocking structures of economic and political power. They are shaped by power relations at a number of different spatial scales. The actions of a community slum landlord, decisions regarding the direction of new street-car tracks or port additions, and the choice by a large non-local firm seeking a new location all play a role in the development of industrial districts. Industrial space from this perspective is a shared commodity used by different actors in different ways: firms exploit space as a means to implement their productive

strategies; workers use space to satisfy their family, cultural and work needs; land developers segment space to achieve greater profits; utility companies wire space to transmit their power; cities both administer and exploit space. Obviously, industrial spaces differ from residential spaces through their concentration of economic activities. In this chapter I will provide three perspectives on industrial districts that will be used later on to generate insights into the Montreal case.⁵

First, industrial districts are the geographical manifestation of the uneven and divergent development of the manner in which production was organized. The creation of new sets of place-specific social relations were also instrumental in the formation of new work environments. The array of productive strategies, differentiated as they were in terms of their technological, labour and organizational structures, took on different forms in space. Each production format was associated with a different profile of the social relations of production and with the locational requirements of firms and industries. For example, as I will show in Chapter Six, the labour force, labour process, technology, raw material sources, distribution networks and authority structures of the large cotton factory differed fundamentally from that of the machine shop and the rolling mill. Even within a very specific industrial branch, the choice of production opportunities open to firms varied greatly as

⁵ My purpose here is not to subsume reproductive processes under those of production, but to point out that the making of industrial spaces involves stepping out of the strait-jacket of purely economic decisions made on the shop floor, factory office, or the boardroom. Even though reproductive issues are not my concern here I found it necessary to set industrial space within a wider context.

demonstrated by the history of the three large American sewing machine companies.⁶ These differences were translated into distinct locational patterns within the city.

Second, each wave of economic growth lay down a dominant form of production; the laying down of different forms added to the complexity of the production system as a whole. New production forms were dependent upon the restructuring of production over time. New work environments were necessary if the cycles of growth were to be implanted in the landscape. The emergence of new production formats over time was associated with the constant need to develop new industrial districts. At the same time, as new forms of industrial organization were deeply rooted in place, and once established difficult to uproot, an element of the creation of new productive relations was the development of new industrial districts.

Third, each industrial complex is a conduit for the circuits of different capital fractions: mercantile, land, financial, as well as manufacturing. They can come into being for a variety of reasons, depending on the agents involved and these agents' relationship to the production/land nexus. Manufacturers, for example, are interested in the development of industrial districts which suit their own purposes, are equipped with infrastructure, are readily accessible to a labour force, and permit a layout suitable for the movement of goods. Property owners including builders, land speculators, and promoters, on the other hand, wish to make a profit through the resale or the rental of land and buildings. Whether searching for a way to reduce the

⁶ D. Hounshell, From the American System to Mass Production, 1800-1932: the Development of Manufacturing Technology in the United States (Baltimore: John Hopkins Press, 1984), chap. 2.

costs of production or to gain profits, a number of agents are involved in the way that space is used for production. This involves the conditions for, and eventually, the development of a built environment that would allow for the establishment of productive activities. New industrial spaces are created in an attempt to refashion space in such a way as to not only reduce production costs and generate profits, but also as a means to restructure the way that production takes place.

Few writers concerned with the development of urban industrial geography have attempted to place the construction of industrial districts within a framework which includes the importance of the active creation of the built environment. For the most part, writers have seen the internal dynamics of production as the foundation for urban growth, and by implication, the construction of industrial districts. Let us take two recent examples. First, according to Walker and Storper,

in contemporary capitalist societies, economic development is principally the outcome of production activities organized in the form of industries. The development of these activities and their locational dynamics are responsible for urban and regional development.

Secondly, Scott claims that the development of industrial localities "revolve[s] around the evolutionary logic of the industrial system and its associated local labor markets, and the endogenous dynamic of growth and development that this logic sets in motion".⁷ The problem common to these writers is their economic essentialism. One effect of this is that they neglect the degree to which the social construction of space is part of urban and regional development. In the above accounts, the built

⁷ M. Storper and R. Walker, The Capitalist Imperative: Territory, Technology and Industrial Growth (New York: Basil Blackwell, 1989), p. 8; A.J. Scott, New Industrial Spaces (London: Pion, 1988), p. 41.

environment is perceived as a passive backdrop to the more complex and variegated workings of the internal dynamics of production. The built environment, if it is addressed at all, is a construction which follows the lead, or fulfills the needs, of industry. The argument is a functionalist one where the built environment is a "passive backdrop to other social processes".⁸

The active process of building industrial districts with its many actors and multiple objectives, is the object of our study, as we try to escape that treacherous perception of space as mere scenery for the drama played out in the industrial sphere. We recall how social scientists have devalued the importance of space in general, and its role in the construction of industrial districts in particular.⁹ Production space is treated as a product of production processes, and urban social space is relegated to a superstructural component of production.¹⁰ More importantly, writers such as Scott, have not paid attention to the social relations that constitute the forces behind the historical development of urban productive spaces. I will now turn to a discussion of two elements that are critical for understanding the

⁸ M. Ball, "The built environment and the urban question", Environment and Planning D, 1986, 4, p. 447.

⁹ J.A. Agnew, "The devaluation of place in social science" in J.A. Agnew and J.S. Duncan (eds.), The Power of Place: Bringing Together Geographical and Sociological Imaginations (Boston: Unwin Hyman, 1989), pp. 9-29.

¹⁰ Although writers state that social space is not relegated to production space in their accounts of urban development this is, in many cases, simply paying lip-service to recent social theory which calls for the need to better integrate civil society and production. For example, Scott in Chapter 11 of Metropolis: From the Division of Labor to Urban Form (Berkeley and Los Angeles: University of California Press, 1988), goes to great pains to stress that "social reproduction in the urban environment is [not] fixed uniquely in response to the needs of the production system" (p. 218). However, the entire chapter is a hymn to the production/base and society/infrastructure dichotomy.

creation of manufacturing spaces: divergent productive strategies, and the active construction of the built environment.

4.3 Industrial Spaces and Production Formats

New industries seem to 'leapfrog' in space, to establish new growth centres somewhat discontinuous with highly industrialized regions.¹¹

Michael Storper's discussion of the leapfrogging of industries within the context of "geographical industrialization" provides an important point of departure for an understanding of the development of new industrial spaces in the nineteenth-century city.¹² While his argument is directed to an appraisal of the rise of new industrial complexes separate from existing urban areas, some elements from his discussion can be usefully incorporated into an examination of what Philip Scranton, in a description of Philadelphia in the nineteenth century, has called "congeries of Marshallian districts".¹³ Storper argues that growth industries, through the introduction of new technologies, the intensification of the division of labour, and the capturing of new markets, create new thresholds of productivity which give them "the tactical flexibility to undertake radically new spatial strategies which are not limited

¹¹ M. Storper, "Technology and new regional growth complexes: the economics of discontinuous spatial development" in P. Nijkamp (ed.), Technological Change, Employment and Spatial Dynamics (Berlin: Springer-Verlag, 1985), p. 49.

¹² Cf. Storper and Walker, The Capitalist Imperative.

¹³ "Many cities, many hills: production, space, and diversity in Pennsylvania's urban history", Pennsylvania History, 1992, 59, 1, p. 32.

by strict price competition."¹⁴ Using this idea in conjunction with the concepts of external economies, conflict within the work place, and the different productive strategies firms employ, it is possible to begin building an understanding of the development of a range of industrial districts within the city after 1850.

Production formats and urban industrial structure

In this section I will examine the implications that the notion of production formats has for the reorganization of urban industrial structure. I suggested in Chapter Three that distinct strategies of production, with different technologies and structures of labour and management, operated within and between industries. I suggest here that from as early as the mid-nineteenth century one consequence of the variety of production formats was a range of industrial districts.

To determine how multiple industrial complexes came about we need to examine the broad processes affecting urban locational choices in the context of the diversity of paths of industrialization. This involves a discussion of two principal points: the development of external economies and the rise of central manufacturing districts; and the emergence of new industries, technologies, and new divisions of labour and their impact upon urban space.

The broad context for the development of new industrial spaces in the nineteenth century lies with the transformation from mercantile to industrial capitalism. In the mid-nineteenth century the transformation from artisanal to factory

¹⁴ Storper, "Technology and new regional growth complexes", p. 62.

production extended the scope of and changed the demand for urban locations. The widening of market demand; the creation of regional and national sources of raw materials at the expense of local ones; the substitution of steam and water-driven machines for hand tools; the intensification of the division of labour; the increased utilization of pools of women, children and immigrant labour; and the development of more intricate intra-firm command systems all contributed to changes to locational choices. Stemming from this are two points: first, new industrial districts were constructed from as early as the burst of capitalist industrialization beginning in the late 1840s; and second, industrial locational coordinates cannot be framed within the simple polarization of central districts/small, labour-intensive firms and suburban districts/large, capital-intensive firms.

One of the defining features of the nineteenth-century city was the clustering of a large number of manufacturing firms in the central core.¹⁵ As many writers have shown, the choice of a central location for many firms was heavily influenced by the need to reduce input-output costs and the creation of external economies. The type, viability and extent of linkages within the city were critical to both a firm's and the city's success. As we saw in Chapter Two, input-output relations existing among firms and the externalization of productive activity are the source of the

¹⁵ R. Walker, "The transformation of urban structure in the nineteenth century and the beginnings of suburbanization" in K. Cox (ed.), Urbanization and Conflict in Market Societies (Chicago: Maaroufa Press, 1979), pp. 165-212 and "A theory of suburbanization: capitalism and the construction of urban space in the United States" in M. Dear and A.J. Scott (eds.), Urbanization and Urban Planning in Capitalist Society (New York: Methuen, 1981), pp. 383-429; D. Ward, Cities and Immigrants (New York: Oxford University Press, 1971), chap. 3; S.B. Warner, The Private City: Philadelphia in Three Periods of its Growth (Philadelphia: University of Pennsylvania Press, 1968).

agglomeration economies which are seen as decisive in the trend towards the centralization of industry in the nineteenth century. It is generally accepted that firms regardless of their scale, technological development, labour force, raw material sources, and markets sought a central location to gain access to agglomeration economies and to reduce input-output costs. The initial advantage that the older cores of cities had enabled inter-linkages to develop, leading to decreasing costs of production, which in turn, led to even more linkages between firms.¹⁶ The result was that both non-mechanized, small-scale firms with uncertain and changing demand producing non-standardized goods, and large-scale firms reliant on the transportation nodes of the core, coalesced into a large and tight cluster of manufacturing firms in the central district.

The centralization of production in the nineteenth-century city was associated with a wide range of productive strategies and with almost the entire industrial spectrum. As numerous studies have shown, a wide gamut of the period's industries, regardless of their productive strategies, were clustered in the central core: clothing, boot and shoe, printing, cabinet and furniture and metal establishments, along with most of the city's administrative, financial and commercial activities, formed a tight and highly developed economic complex. For example as I show in Chapter Five, in the clothing industry manufacturers employing a diverse set of productive strategies formed one of the largest and most concentrated industrial complexes in the central

¹⁶ A.J. Scott, "Locational patterns and dynamics of industrial activity in the modern metropolis", Urban Studies, 1982, 19, pp. 111-142; Ward, Cities and Immigrants, chap. 3

city: large-scale shirt manufacturers employing large numbers of workers inhouse along the lines of a detailed division of labour; merchant tailors and clothiers who provided work for hundreds of women through the putting-out system; and the small made-to-measure tailoring enterprise all depended upon and took advantage of central agglomeration economies.

With the coming of the first industrial revolution and the changes to the size and character of the total manufacturing ensemble there was growing pressure on central land. One effect of this pressure and the need to minimize costs through the reduction of the physical distance between firms was to intensify the specialization of industrial space. The central agglomeration district became increasingly broken up into sub-districts: in nineteenth-century Montreal the boot and shoe industry clustered around Victoria Square; job printers congregated in a belt that passed through the chief financial and commercial zone of Old Montreal; and carriage-makers were spread throughout the periphery of the core. Manufacturing firms nestled within the spaces where other central functions of finance, administration and commerce were congregated. They also had to compete with these functions for scarce and increasingly more expensive centrally-located land.

The ability of the old central mercantile district to accommodate the growing numbers of manufacturing establishments after 1850 was made possible through the remodelling of its space and the invasion of contiguous districts. Existing central manufacturing districts that catered to the needs of mercantile and handicraft activities were, without substantial remodelling, unable to accommodate the larger-

scale plants with their new physical layouts, more extensive use of land, and different sets of work relations. Adapting the old central district to the growing and new needs of an expanding and different industrial base took many forms. With the implementation of new technologies such as steel framing and elevators, extra floors were added to existing buildings and new buildings were built higher. The internal layout of buildings was reorganized to allow for the implementation of new sources of motive power and new ways of organizing the labour process.¹⁷ While the average building had three or four storeys at mid century, by the turn of the twentieth, some buildings reached fifteen or more storeys. Alongside this vertical growth, central business functions, thanks in part to the absence of building by-laws, spread out into the surrounding districts, converting residential buildings and public space into manufacturing, commercial and financial spaces.¹⁸ In Montreal in the second half of the nineteenth century, substantial parts of Saint-Antoine, Saint-Lawrence and Saint-Jacques wards were incorporated within the ambit of central city functions. While invasion of the residential districts was one form for adding more space, another was the demolition of existing buildings to make way for the construction of transportation terminals and for new and larger buildings. In Montreal in 1861, for example, the Hotel Dieu hospital left its central location for the northern edge of the city; in its place new warehouses were built and the layout

¹⁷ C.M. Rosen, The Limits of Power: Great Fires and the Process of City Growth in America (Cambridge: Cambridge University Press, 1986).

¹⁸ Ward, Cities and Immigrants, chap. 3; M.J. Bowden, "Growth of the central districts in large cities" in L.F. Schnore (ed.), The New Urban History: Quantitative Explorations by American Historians (Princeton: Princeton University Press, 1975), pp. 75-109.

of the streets restructured. Another form of adaption was the remodelling of existing infrastructure through the pumping of capital investment into the harbours, utilities and railways. The outline of the Montreal harbour went through several configurations in the nineteenth century as the federal government funnelled large chunks of capital into up-dating existing facilities and building new ones.

While the old central district was remodelled and its share of urban territory expanded through its capture of contiguous districts, it was not able to provide other necessary 'locational factors' that many firms required. Even though an enlarged and remodelled core was able to capture a growing number of manufacturing firms after 1850, it suffered from a series of limitations and contradictions which made it increasingly unattractive. These included increasing competition for and the rising costs of land and space; the inadequate plant layout of many buildings; the growing costs of congestion; the association of the core with older forms of production; and the institutionalization of class conflict. Although the central core had a significant advantage in the form of existing wholesale, communication, and transport networks, many of the newer firms required a different set of spatial factors.

In particular, they needed to create new spaces through which they could implement the technological, labour and organizational changes that were part of capitalist industrialization. While Storper's idea of the development by growth industries of a new set of spatial strategies provides some important clues to understanding the development of urban non-central industrial complexes, we should note that his argument, at the intra-urban level, has a major weakness. While new

industries as a whole may have the ability to establish a new spatial configuration at the regional level, it is just as, if not more, likely that particular firms from specific industries have a greater "tactical flexibility" to make new spatial decisions at the urban level. In the first place, most industries, not just new ones, have firms which are capable at specific periods to forge greater levels of productivity than other firms in the industry through their control over a new innovation, the extension of their market or an addition to an existing technology. Second, it is unlikely that industries as a whole, rather than individual firms, are able to employ new spatial strategies because industries are splintered by the diverse array of productive strategies. In other words, the development of new urban industrial spaces would be related to the emergence of particular growth industries, but the specific mix of productive formats within industries would also be critical to locational choices of firms.

While centrally-located linkages provide an important element for understanding the industrial geography of the city between 1850 and 1918, evidence from other cities indicates that there was a diversity of linkage arrangements, some of which gave rise to locational possibilities other than a central one. In the nineteenth century the range of productive strategies generated a situation where firms and industries had their own specific set of needs such as the source and access to raw materials, the type of labour power, the extent and location of markets, and the distribution network. The kinds of linkages firms rely upon can vary enormously, and different production formats are characterized by distinct patterns of linkages. Firms which rely on different sources of power, for example, may see different

advantages in a site. Firms of different sizes will take a different view of the unit cost and the layout of floor space. Firms with specific labour requirements may be drawn to particular areas because of particular pools of labour - male or female, rural or immigrant, skilled or unskilled. The firm operating or anticipating a large market may wish to locate close to the railroad or harbour. The development of the Philadelphia textile suburbs of Kensington, Spring Garden, Manayunk and Germantown in the nineteenth century, for example, was centred around the creation of a highly personalized series of networks by small, independent masters working within a highly disintegrated industrial environment.¹⁹ An important reason behind the rapid growth of Gary on the southern reaches of Chicago at the turn of the century was the direct physical and corporate linkages between the United States Steel Corporation and the many firms that were quickly established there.²⁰ The search for the best, or at least some reasonable facsimile of the best, array of the wide range of needs that firms and industries required could create a different set of locational choices other than the city core. These choices varied between industries. While the shoe and metal-fabricating industries in Montreal were often similar in terms of their structure (small to medium scale, changing demand, a degree of mechanization) they occupied different locations (shoe - central; metal-working - not central) despite the fact that their linkage needs were structurally

¹⁹ P. Scranton, Proprietary Capitalism: the Textile Manufacture at Philadelphia, 1800-1885 (New York: Cambridge University Press, 1983).

²⁰ G.R. Taylor, Satellite Cities: a Study of Industrial Suburbs (New York: D. Appleton and Company, 1915), chap. 6.

similar.

Furthermore, different sets of linkages may have arisen within the context of different sets of "rational" behaviour. It is questionable whether all, or any, manufacturers made rational decisions about location based on the economic costs of linkages. Even if entrepreneurs were able to make such rational decisions there were other factors which may have pulled firms from the central manufacturing complex. In the period before the advent and subsequent diffusion of scientific managerial practices and bureaucratic cost calculations within the firm, "non-economic" considerations such as ethnic and artisanal culture may have played a role in the choice of location. Proximity to family, work, and ethnic networks could have been an important consideration for the small manufacturer willing to absorb the higher costs of a non-central location. Access to particular labour skills, circuits of specific knowledge, or particular institutions may have been more critical to some ethnic employers and masters than the more general economic considerations of the core.

Two critical elements in the literature behind the centralization of production in the nineteenth century are the relatively "undeveloped" state of technology and the small scale of firms. It is generally accepted that a certain degree of mechanization was necessary before enough large-scale firms with well-developed internal economies of scale could free themselves from the central core and locate on the urban periphery. Was this so? In the first place, technological changes in motive power were implemented throughout the industrial system, and had an important

role in the realignment of urban industrial space. The obvious example at mid-century was the widespread adoption of steam-powered machinery which freed firms from the restricted sites of hydraulic power, expanded the scale of many enterprises, and, in turn, created a demand for new factory sites.²¹ The larger users of steam power and machines began to seek waterfront or rail-serving sites for receiving and stock-piling coal, and sought new types of buildings to house the boilers and the machines. Improved efficiency of boilers and steam engines fostered larger batches and adoption of trains of machinery which brought together larger labour forces: the attraction of new jobs encouraged immigration to the city and freed those employers from pre-existing social conditions. At the end of the century, the restrictions of steam engines were overcome by the development of electrical generators which allowed a greater flexibility in both the firm's location within the city and its own internal layout. These technical changes, once in operation, were powerful forces behind the restructuring of the production formats, the creation of new sets of linkages between firms, and the demand for different types of spaces.

A second point is that after 1850 many large-scale firms in a variety of industries with relatively sophisticated forms of technology or highly developed forms of division of labour were apparent.²² The emergence of large firms after mid-

²¹ It should be noted that hydraulic power could play an important role in drawing firms from the central core to more peripheral locations within the city. As we shall see in the section on the West End in Chapter 5.6 this was the case for the development of the industrial district alongside the Lachine Canal after 1850.

²² J. Atack, "Firm size and industrial structure in the United States during the nineteenth century", Journal of Economic History, 1986, 44, pp. 463-475.

century which employed hundreds of workers and invested huge amounts of capital into machinery and buildings, led to the development of a highly segmented division of labour, and required new forms of plant layout set into motion the search for a new set of spatial strategies. With the growing disparity between the largest and smallest firms in terms of the value of their output, the number of their employees, and the scale of their plant, there was a concomitant reordering of the spatial relations between them. Even without mechanization, industries could grow rapidly through the intensification of the division of labour. An illustration of this is the meat-packing industry in which a highly developed division of labour took place despite little mechanization. The large scale that individual packing houses and stock yards reached forced manufacturers to find new locations; for example, the Union Yards and several packing houses moved to Chicago's South Side in 1865.²³

The development of non-central productive spaces was also predicated upon the existence of resource factors which provided a set of attractions for manufacturers. An obvious illustration of this is the development of industrial districts of Fullerton, Whittier and Brea on the southern edge of Los Angeles which were geared to oil extraction.²⁴ The possibility of attracting a labour force because of an area's cheap housing may have been important to manufacturers who were dependent upon specialized workers. The laying down of basic infrastructures - railway lines, hydraulic power and dock facilities for example - would have been

²³ J. Barrett, Work and Community in the Jungle: Chicago's Packinghouse Workers, 1894-1922 (Urbana and Chicago: University of Illinois Press, 1987).

²⁴ Viche, "Black gold suburbs".

attractive to firms reliant on large shipments of bulk materials and a national market. Particular configurations of relations between local manufacturers, suburban politicians and land developers could create the conditions for the creation of a working-class industrial suburb. Lastly, the establishment of a large factory in a previously unsettled area could have acted as a magnet for other firms. In other words, industrial districts throughout the city could come into existence through the creation of non-central agglomeration economies by attracting supplier and buyer firms; enabling land developers to construct housing; and forcing the municipal government and private utility companies to provide essential infrastructural services.

The realignment of power relations between capital and labour would have been an important consideration in a manufacturer's choice of location. It is likely that for some manufacturers the relocation (or the establishment) of their firm away from the centres of labour organization and unrest would have played an important role in their assessment of the location of their firm. This does not mean that we have to accept Gordon's assertion that the state of class conflict in the urban core at the end of the century was the determining feature behind the movement of industry to the periphery.²⁵ Indeed, for most firms the issue of control was fought over at the workplace. Manufacturers could, however, use relocation as a weapon to force workers to accept their terms. New firms looking for a location, being more

²⁵ D.M. Gordon, "Capitalist development and the history of American cities" in W.K. Tabb and L. Sawers (eds.), Marxism and the Metropolis (New York: Oxford University Press, 1978), pp. 25-63.

mobile, could seek a site away from the centres of unrest. Workers' challenges to the industrial order, at least, would have made a suburban location attractive to many manufacturers, and in some cases would have been a strong factor in the removal of firms from the central districts. The removal of the main Pullman Palace Company factory from Detroit to the southern periphery of Chicago in the 1880s was an attempt by the company to restructure the power relations between the company and its workers.²⁶ As the city core became associated with industrial conflict, the creation of new industrial spaces would have been a way for some manufacturers to "reassert both economic and social control" of labour, at the workplace and in the community²⁷, and to generate greater profits. Although relocating firms may adapt their production process to the types of labour already in place, relocation to new sites was also a way for firms to accelerate turnover time through gains made by more rapid distributional methods, more efficient internal layout, and the installation of new machines. The ability of manufacturers to impose these new productive relations was hindered by workers' strategies, both informal (slowdowns, machine sabotage, working to rule) and formal (strikes). Throughout the nineteenth century, as the urban proletariat increased in size, and waves of worker militancy and organization swept over the industrial landscape, the development of new industrial spaces such as Pullman, and Norwood and Oakley, north of Cincinnati became

²⁶ Buder, Pullman.

²⁷ P.J. Ashton, "The political economy of suburban development" in Tabb and Sawers, Marxism and the Metropolis, p. 71. This perspective centres on the idea that manufacturers moved their plant from the core to the periphery in an attempt to control labour. It is just as possible that they moved because they already had control.

enticing to manufacturers.²⁸ In fleeing already established industrial districts, manufacturers wanted not only to create a new set of material structures, but also to construct a new set of work relations through which they could impose their authority over workers, and control their profit margins.

We cannot assume, as Storper does, that each technological innovation provides another degree of freedom of location in a monotonic progression toward autonomy and a 'footloose industry'. But from the 1850s on, new technologies, increased flows of capital, and a more intense division of labour did change the relative value of urban sites, and the perception a firm had of its existing location and its alternatives. New firms and industries of all scales can choose newer sites at a distance from existing districts, depending on their linkages to other firms, industries, and physical and social infrastructures. New industries through the introduction of more intricate and powerful machinery, new ways of segmenting labour, and the creation of new distributional networks can create new linkages and modify or extinguish existing ones. They can redraw the existing logic through the creation of new cost structures, the establishment of new labour needs, and the transformation of physical structures. The result is the re-spacing of relationships and the revaluing of locations. For already established firms, the installation of new technologies also forces a re-evaluation of its location. Actual relocation is hindered by dependence on a suitable labour force, the establishment of suitable premises and

²⁸ Ashton, "The political economy" pp. 70-71; Buder, Pullman; Gordon, "Capitalist development and the history of American cities"; Taylor, Satellite Cities.

sites; and the amount of fixed capital already implanted in existing plants. These can be serious problems for the redrawing of a firm's locational coordinates. Other forms of rationalization often in response to the technological advances of competitors can play a decisive part in the reappraisal of a firm's location. The decision to narrow product lines, for example, rather than introduce new assembly-line machinery could lead to relocation. Such was the case of Philadelphia's textile industry in the decade after World War I.²⁹

The on-going creation of new urban industrial spaces took place within waves of economic growth. Connections between production relations, space and time in the literature have been made through the elucidation of rounds of investment over time and how they shape a place's geography and history.³⁰ Each round of investment, or wave of industrial growth, produces new forms of mechanization, labour organization, financing and marketing. At any one time a city is ensconced within a particular spatial division of labour, but as waves of investment occur this position within the wider division of labour changes. At the same time, there are dramatic effects upon the internal structure of cities and industries: new work relations and production strategies are established, social and productive spaces are reformulated, and political agendas are rewritten.

²⁹ P. Scranton, "Beyond anecdotes and aggregates: the pattern of industrial decline in Philadelphia textiles, 1916-1931", *Antipode*, 1986, 18, pp. 284-310.

³⁰ D. Massey, *Spatial Divisions of Labour: Social Structures and the Geography of Production* (London: Macmillan, 1984); B. Warf, "The resurrection of local uniqueness" in R.G. Golledge, H. Courcelis and P. Gould (eds.), *A Search for Common Ground* (Goleta: Santa Barbara Geographical Press, 1988), p. 54.

Industrial districts and waves of growth

As we saw in the last part of Chapter Three, where we looked at the relationship between long waves and urban development, there are a number of different cycles, each of which has importance in different ways. The fifteen to twenty year Kuznets or building cycle through its impact on the built environment plays a decisive part in the development of industrial districts. It has been identified with waves of industrial output, prices, building construction, and immigration.³¹ Like the long wave, the building cycle is characterized by swings of expanding and decreasing output. At the urban level, the upswing is associated with rapid fixed capital formation, construction of physical and social infrastructure, intensification of land development, and expanding employment and immigration. The troughs are periods of stagnation and depreciation of built capital.³² In America, as one writer has stated, "development during the nineteenth and early twentieth centuries took the form of a series of surges in the growth and output and in capital and labor

³¹ M. Abramovitz, "The nature and significance of Kuznets cycles", Economic Development and Change, 1961, 19, pp. 225-248; A.F. Burns, Production Trends in the United States Since 1870 (New York: National Bureau of Economic Research, 1934); R.A. Easterlin, Population, Labor Force and Long Swings in Economic Growth, the American Experience (New York: National Bureau of Economic Research, Columbia University, 1968); W. Isard, "Transport development and building cycles", Quarterly Journal of Economics, 1942, 57, pp. 90-112 and "A neglected cycle: the transport-building cycles", The Review of Economic Statistics, 1942, 24, pp. 149-158; S. Kuznets, Secular Movements in Production and Prices (Boston: Houghton Mifflin, 1930).

³² Actual disinvestment has yet to be demonstrated for the period of interest to us, although by World War I there are distinct signs of disinvestment in the western part of the city. It is evident in the present era in the wholesale abandonment of industrial districts in northern England and the United States seaboard. It can also be seen in the appearance of inner-city 'blight' in the United States in the 1930s, and as a feature of urban renewal ventures. Disinvestment is not the concern of this thesis, although I do touch upon it in the discussion of the western district in Chapter Six.

resources followed by periods of retarded growth".³³ Writers have also noted that rates of movement of firms from the central core increase during times of expansion and decrease in times of decelerated growth.³⁴

Synchronized with the ebb and flow of the North American economy were waves of immigrants.³⁵ The nineteenth-century flow was made up mainly of immigrants from Britain, Ireland and Western Europe, while at the end of the century, immigrants from Eastern Europe, Russia and Southern Europe began arriving in large numbers. Each new immigrant group brought with it a new set of cultural assumptions, skills, and values that clashed with, and eventually had to be accommodated within urban society. These groups, depending on their time of arrival, their acceptance by the host society, and their skills, were integrated into the urban space-economy in different ways.³⁶ Distinct ethnic divisions of labour were created in both skill levels and industrial concentrations. In Canada at mid-century, for example, the Irish were concentrated in low-skilled and manual labour jobs while the English dominated the more skilled blue-collar and professional employment; by the turn of the century, Italians were moving into the construction trades, and Jews

³³ Abramovitz, "The nature and significance", p. 229.

³⁴ D.M. Manson, M. Howland and G.E. Peterson, "The effect of business cycles on metropolitan suburbanization", Economic Geography, 1984, 60, 1, pp. 71-80.

³⁵ J.F. Bodnar, Immigration and Industrialization: Ethnicity in an American Milltown, 1870-1940, (Pittsburgh: University of Pittsburgh Press, 1977). S. Olson, "Ethnic strategies in the urban economy", Canadian Ethnic Studies, 1991, 33, 2, pp. 39-64.

³⁶ Olson, "Ethnic strategies".

were heavily concentrated in the garment industry.³⁷ Old spaces were readapted and new spaces were created by these waves of immigration. One effect was the segregation of the various ethnic and cultural communities: the inner-city was converted into densely-packed immigrant districts, while the rest of the city became not only the predominant residential district of the middle classes, but also the location for formally sub-divided working-class districts and the home of the poorer elements living in shanty towns.³⁸ Residential spaces were divided in a variety of ways. O. Zunz has argued that nineteenth-century Detroit was characterized by cross-class ethnic neighbourhoods, while other studies have found that cross-ethnic class communities built around the relationship of home and work were part of the landscape in cities such as Philadelphia before 1918.³⁹

New transportation systems were constructed in waves of twenty to twenty-five years and stretched the limits of locational choices for individuals and firms. Some writers have viewed transportation investments, which are powerfully cyclical, as

³⁷ B. Bradbury, "The family economy and work in an industrializing city: Montreal in the 1870s", Canadian Historical Association, Historical Papers, 1979, pp. 71-96; Olson, "Ethnic strategies". Also see Barrett, Work and Community; D.M. Gordon, R. Edwards and M. Reich, Segmented Work, Divided Workers (New York: Cambridge University Press, 1982); Y. Schreuder, "Labor segmentation, ethnic division of labor and residential segregation in American cities in the early twentieth century", Professional Geographer, 1989, 41, 2, pp. 131-143;

³⁸ While the literature on the suburbanization of the middle class is large and well known, our knowledge of working-class non-central residential areas is small. The recent work of R. Harris has begun to fill this gap: see "A working-class suburb for immigrants, Toronto 1909-1913", Geographical Review, 1991, 18, pp. 318-332, while for a discussion of shanty towns see his "Pioneering the jungle suburbs: owner-building in North American cities, 1900-1950", manuscript, McMaster University, Hamilton, Ontario.

³⁹ O. Zunz, The Changing Face of Inequality (Chicago: University of Chicago Press, 1981). For a discussion of the different descriptions of residential segregation see R.D. Lewis, "The segregated city: class residential patterns and the development of industrial suburbs in Montreal, 1861 and 1901", Journal of Urban History, 1991, 17, pp. 124-127.

leading to industrial, commercial, and population growth, which in turn generated building activity.⁴⁰ While we must be careful not to place transport innovations as the determining factor in industrial and urban growth, transport improvements did cut costs and were an important factor behind the reduction of turnover time of capital. Within the city new forms of carrying people were introduced in the middle and at the end of the nineteenth century. In the mid-nineteenth century the installation of the omnibus system provided a rudimentary transportation system which had little effect on the shaping of urban form because of the pedestrian nature of the city at this time. The development of the electric streetcar after 1890 allowed for the massive expansion of the built environment through its faster speeds, as I demonstrate in Chapter 6.3. Between cities, faster and larger steamships and locomotives, and more efficient communication systems enabled the greater and faster flow of goods between regions and widened the markets of firms that were able to take advantage of changes of technological and distributional innovations.

The formation of new industrial complexes was aligned with surges in the construction of the built environment. As capital became more available, industries could implement the new production technologies by constructing buildings with a different plant layout, or take advantage of new distribution, transportation and communication technologies. Capital was made available for investment in new homes as well as new manufacturing facilities. Recent ideas about the relation of waves of capital investment to the development of the urban built form have centred

⁴⁰ Isard, "A neglected cycle".

on David Harvey's discussion of the way capital moves between sectors in the course of cycles. When an economic crisis occurs in the "primary" circuit of manufacturing, capital moves into the "secondary" circuit of land and housing.⁴¹

As new industrial districts were created on a wave of expansion, they added a new option in the industrial geography of cities. There was an enlargement of the scope of locations that firms could choose from. As we have seen, new districts sometimes emerged in areas spatially separate from existing districts, usually as satellite towns, suburbs, or accretions to the city periphery. These districts usually differed from the older districts in terms of their scale, technology, labour processes, and industrial type, as new firms had greater flexibility to move. New productive spaces also emerged as outgrowths of older districts or extensions of the original area: the forces underlying their development were often similar to the ones giving rise to the original district in the first place. New industrial spaces could be created in existing areas through either the expansion of existing firms or the addition of new firms by rebuilding the district or by reorganizing its inferior spaces.

Each round of economic change provides a new locational logic for a district, only to be made redundant, diminished in importance, or modified in form with the next set of changes. The development of a new industrial district closer to the city edge, for example, would modify the existing transactional cost and organizational relationships between firms in the city. Each wave of economic change leaves its

⁴¹ D. Harvey, "The urban process under capitalism: a framework for analysis" in Dear and Scott (eds.), Urbanization and Urban Planning in Capitalist Society, pp. 91-121.

imprint upon the landscape. It does not necessarily do away with old centres of production, but is likely to take on different forms and content. Each industrial district is distinctive. Each new round in the formation of industrial districts is associated with a new generation of technologies, industries, and labour processes.

The construction of new industrial spaces conducive to the creation of new, or modification of existing, social relations are necessary for the successful realization of production. The development of new productive relations was allied with new conceptions of how production was to be organized and the types of spaces that would accommodate this. The creation of new production formats - a direct consequence of new productive relations - would take on a distinct spatial character. Over time, as the effects of waves of economic growth or decline piled upon each other, there would be laid upon the landscape a complex geography of industrial organization. The newer industrial districts were not necessarily populated by firms which were capital intensive nor technologically advanced. Many of these firms could remain centrally located due to such considerations of capital invested in the plant, access to raw material transportation sites, access to particular forms of labour, and the need to take advantage of face-to-face contacts of the central city. On the other hand, many firms, usually new starts, would seek sites in the industrial districts a distance from the core to take advantage of a new labour force and to intensify the pace of production.

While the restructuring of the technological, labour and organizational basis of production was responsible for reorganizing the locational coordinates of firms

and industries, especially the viability of the older, more central districts, the uneven development of industry and the wide array of production formats meant that urban industry was not reduced to choosing between central and peripheral sites. Locational choice can not be reduced to the two types dramatized in the literature where the large-scale, capital-intensive firm chooses the periphery and the small-scale, labour-intensive one remains centrally located.

4.4 Industrial Districts and the Built Environment

Montreal has not bestirred herself to take advantage of her position. We have been squabbling over petty local grievances and prejudices while the trade of a continent was knocking at our doors ... Local questions absorb our energies to the exclusion of greater issues, and our rulers seem unable to grasp the gigantic possibilities of a bolder policy.⁴²

While many writers continue to analytically separate productive activities from the construction of the built environment the viability of this conception has recently been questioned.⁴³ The central concern of each of these writers, although each has

⁴² Canadian Journal of Commerce, December 13, 1889, p. 1037.

⁴³ Agnew, "The devaluation of place in social science"; Ball, "The built environment and the urban question", "Housing analysis: time for a theoretical refocus?", Housing Studies, 1986, 1, pp. 147-165, and "Housing provision and comparative research" in M. Ball, M. Harloe and M. Martens, Housing and Social Change in Europe and the USA (London: Routledge, 1988) pp. 7-40; K.R. Cox, "The politics of turf and the question of class" in J. Wolch and M. Dear (eds.), The Power of Geography (Boston: Unwin Hyman, 1989), pp. 61-90; K.R. Cox and A. Mair, "Locality and community in the politics of local economic development", Annals of the Association of American Geographers, 1988, 78, pp. 307-325 and "Levels of abstraction in locality studies", Antipode, 1989, 21, pp. 121-132; J.R. Logan and H.L. Molotch, Urban Fortunes: the Political Economy of Place (Berkeley: University of California Press, 1987); P. Marcuse, "Gentrification, homelessness, and the work process: housing markets and labour markets in the quartered city", Housing Studies, 1989, 4, pp. 211-220; D. Rose, "Home-ownership, uneven development and industrial change in late nineteenth-century Britain" (D.Phil., University of Sussex, 1984). It should be noted that this practice of separating production from the built environment is present in those writers who are interested in the development of urban infrastructures. For example, a recent review of the construction of the urban built environment pays no attention to the impact that production has upon the

his or her own different emphasis, is that the relationship between capitalism and the built environment is socially constructed. The process of city building is not a linear one with production giving rise to urban space. As the Montreal commentator above suggests, the preoccupation with "local questions" at the expense of Montreal's wider position were proving to be detrimental to the city's fortunes. But this concern with "petty local grievances and prejudices" was critical to the growth of cities. Accordingly, this section will deal with the issue of the manner in which urban areas develop. The focus will be upon looking past the common misconception that the internal dynamics of production is the determining, if not single, cause of urbanization and re-situate them in a context of the social construction of space. Over the last decade a number of writers have provided some valuable clues for a reassessment of the relationship between production and urban space.

Some perspectives on the making of the built environment

Perhaps the most inclusive attempt to create a perspective which limits the role of productive activities in the creation of urban space has been presented by Logan and Molotch.⁴⁴ According to them, urban development is "closely determined" by the conflict between use-values and exchange-values of housing. They argue, "that all capitalist places are the creation of activists who push hard to alter how [land] markets function, how [land] prices are set, and how lives are affected".

structure of urban space. See J.W. Konvitz, M.H. Rose and J.A. Tarr, "Technology and the city", *Technology and Culture*, 1990, 31, 2, pp. 284-294.

⁴⁴ Logan and Molotch, *Urban Fortunes*.

In order to pursue these ends, place entrepreneurs form local alliances or growth machines - coalitions of land agents, other business interests and the state - which "attempt through collective action to create conditions that will intensify future land use". Further, Logan and Molotch argue that the city is not a consequence of either an autonomous housing market as perceived by the ecologists nor of the logic of capital accumulation as stated by Marxists.⁴⁵

The critique that Logan and Molotch make of the functionalism which dominates accounts of urban development, provides an opening for a reassessment of the relationship between production and urbanization. Perhaps Logan and Molotch go to the other extreme by making the land market the dominant process in the creation of urban space. The accumulation process is a decisive organizing feature of urban development. To subsume it within the activities of land agents and to treat property markets as the primary process of urban change does not provide a convincing interpretation of the processes underlying urban development. What we need instead is to view the organization of production and the organization of land development as two of the principal foundations of urban development. To better understand this means a consideration of the mechanisms through which these two ordering systems are related and how they, in combination, drive urban development.

A number of other writers have taken up this task. M. Ball, like Logan and Molotch, states that almost all geographic studies have relegated the built environment to a subordinate position: other processes control the manner in which

⁴⁵ Logan and Molotch, Urban Fortunes, pp. 3, 32-34.

the city is constructed.⁴⁶ He presents a perspective which centres around "social relationships of building provision". These are, "specific sets of historically specific and country-specific social relations involved in the creation and use of particular types of buildings" and are manifest in building cycles, in the role of the state in land-use planning and housing provision, and in conflicts between different agents involved in the construction of the built environment.⁴⁷ Ball does not propose an all-inclusive urban theory. He merely suggests that the analysis of how the built environment is created can be linked to the wider concerns of production, consumption and distribution. For example, production is linked to the question of the built environment through both the historically specific social relations of urban development and the construction industry which represents the place of production of the built environment.

Another approach is that of K. Cox and A. Mair who argue that the fluctuating fortunes of cities can be elucidated through the concept of local dependence. This "signifies the dependence of various actors - capitalist firms, politicians, people - on the reproduction of certain social relations within a particular territory".⁴⁸ They see city growth as encompassing more than landed interests. Capitalist firms are subject to local dependence, despite the instability of linkages and the competitive character of capitalism, through the immobility of the built

⁴⁶ Ball, "The built environment and the urban question" and "Housing analysis".

⁴⁷ Ball, "The built environment and the urban question", p. 448.

⁴⁸ "Locality and community", p. 307.

environment and the non-substituability of linkages existing at the local level. The local state is also dependent because of its reliance on a local tax base and its responsibility for long-term investments in infrastructure. At the same time, people are committed to place because it is there that much of the social action affecting their everyday life is situated. The dependence of firms, the state and people leads to the formation of local business coalitions. These coalitions attempt to realign the internal contours of local communities in such a way that localities can be more competitive against one another.

What the work of these writers illustrate is that the urbanization process is overdetermined; the relationship between urban structure and production is not one-dimensional with production as the driving and essential force. Processes other than production contribute to the manner in which cities grow and the layout of their internal structure. This has a number of important implications. First, cities are multi-dimensional structures, and the "connective tissue" between their various layers needs to be reconstituted.⁴⁹ Cities are not mere containers for production but have activities outside of the control of, although linked to, the forces of production.⁵⁰ In other words, cities are socially constructed and have important structures of

⁴⁹ D. Gregory, "Suspended animation: the stasis of diffusion theory" in D. Gregory and J. Urry (eds.), Social Relations and Social Structures (London: Macmillan, 1985), p. 328.

⁵⁰ E.W. Soja, "Regions in context: spatiality, periodicity, and the historical geography of the regional question", Environment and Planning D, 1985, 3, pp. 175-190; M. Storper, "The post-Enlightenment challenge to Marxist urban studies", Environment and Planning D, 1987, 5, pp. 418-426.

subjective relations which create and reproduce them.⁵¹ That is, urban space is more than a blank sheet on which the logical necessities of capital find their empirical expression. At the same time, the reproduction of the labour force and the successful accumulation of capital are also centred around the manner in which urban areas are constructed.⁵² Lastly, the locality is the site where the preconditions essential to the creation of productive activity are formed.

Urban space is one site through which the history of human activity operates within structural constraints. Interacting with these constraints are class-based forces whose actions are bounded by everyday practice at a constricted spatial level. For most this is within the routinized constraints of the local and there is a material basis for people to be dependent upon the immediate environment as people "construct relationships that are difficult to substitute and therefore difficult to replicate elsewhere".⁵³ Individuals identify with a particular locality because of job histories, cultural attachments, and family ties. Manufacturing firms are dependent upon a specific city because of, among other things, specialized labour markets, access to known financial and commercial resources, influence over local councils, and the availability of certain educational and technological facilities. Overseeing the allocation of land in which these routinized daily practices function are powerful

⁵¹ Cox and Mair, "Levels of abstraction in locality studies"; A. Cochrane, "What a difference the place makes: the new structuralism of locality", *Antipode*, 1987, 19, pp. 354-363.

⁵² D. Rose, "Accumulation versus reproduction in the inner city: *The Recurrent Crisis of London revisited*" in Dear and Scott, (eds.), *Urbanization and Urban Planning*, pp. 339-381.

⁵³ Cox and Mair, "Locality and community", p. 313.

groups of agents who "can and do shape the *rules* of the market system within which the ostensibly free land competition is taking place".⁵⁴ To isolate bidding for land, technology or state policy or some other factor as the primary engine of space formation is to cut down, rather than across, the tissue of place.

Local alliances and the making of the built environment

One entry-point for understanding the relationship between the construction of the built environment and production is through a discussion of the agents responsible for the building of cities and their linkages to manufacturing. Within any city a group of elites are, to a large extent, responsible for the development of complexes of productive space. The emergence of local alliances - class-based groupings who through collective action attempt to protect and promote their local interests through the development of place - is critical to the successful realization of the production and circulation of capital. The five major groups of decision makers who control the development process - industrial and commercial capital, land developers, finance capital, the construction industry and the state⁵⁵ - are partially responsible for fashioning the locational possibilities and constraints of manufacturing firms. The interests of local alliance members vary greatly. While

⁵⁴ J. Feagin, "Urban real estate speculation in the United States: implications for social science and urban planning", International Journal of Urban and Regional Research, 1982, 6, p. 40. For an appraisal of the historical development of these groups in the United States see M.A. Weiss, The Rise of the Community Builders: the American Real Estate Industry and Urban Land Planning (New York: Columbia University Press, 1987).

⁵⁵ Feagin, "Urban real estate speculation in the United States".

manufacturers, for example, may not be directly interested in land development per se they are often deeply concerned with the externalities associated with the development of new industrial and housing areas, and with the reconstruction of existing buildings. On the other hand, not all land owners are actively involved in land development or speculation.⁵⁶

The production of industrial space by these decision makers can be direct or indirect. Development of land for industrial estates or the construction of railway spurs are examples of a direct action, while the development of working-class housing, which leads to the provision of labour power in certain parts of the city, is an example of the latter. Although people and firms usually operate individually, the environment in which they function is clearly rooted within wider sets of structured social relations.

A central property of the formation of urban industrial districts is the reproduction of capitalist social relations within a bounded territory. As a portion of capital has to remain immobile for productive activities to take place, local alliances are continually scrambling to find ways to capture new capital and to defend capital already embedded in the built environment. In order to avoid place-specific devaluation of their capital, they promote land development and the construction of

⁵⁶ Logan and Molotch identify three types of people associated with land: serendipitous (passive), active, and structural (involved in the future). See *Urban Fortunes*, pp. 29-31. According to A. Haila, "Four types of investment in land and property", *International Journal of Urban and Regional Research*, 1991, 15, 3, pp. 343-365, there are four types of investment in land and property which are distinguished by the type of agent, the source of capital, the purpose of the investment and its function.

new infrastructure.⁵⁷ In their search to sustain the reproduction of capitalist relations in place, localities become the forum for the interaction between social action, structural constraints, and the physical attributes of an area: "places are defined through social relationships, not through nature, autonomous markets, or spatial geometry".⁵⁸ In this context the formation of urban areas and the spaces that comprise them - industrial, residential, commercial and financial - have a great deal to do with the attempts on the part of land developers and the construction industry to maximize profits and, on the part of industrialists and landlords, to obtain suitable premises for their activities and to reap profits.

Underpinning the concerted actions, and in most cases deeply implicated in the activities, of local alliances is the state. The state, especially the local one, plays an important role as a site of struggle between opposing factions, and as a mediator between the growth coalition and the rest of the population. The state's role in the growth process is to coordinate the coalition, to coax business and residents into accepting a common direction of growth, and to mobilize resources for growth.⁵⁹ It thus plays both a direct and an indirect role in the creation of urban space. Directly, it functions as a planner, generator of infrastructure, and provider of resources. Indirectly, it acts as an ideological vehicle for the legitimizing land

⁵⁷ D. Harvey, Limits to Capital (Chicago: University of Chicago Press, 1982), pp. 419-421.

⁵⁸ Logan and Molotch, Urban Fortunes, p. 45.

⁵⁹ Logan and Molotch, Urban Fortunes, pp. 34-37.

transfers, the opening up of new land, and the maintenance of land values.⁶⁰ At the same time, local government is active as it faces its own problems of local dependence. Its reliance upon a local tax base forces it to take a special interest in the maintenance of the financial and industrial health of place. This involves the creation of a viable built environment, often in competition with other localities, that will accelerate and expand the circulation of capital. This calls for the perennial remaking of the urban physical fabric.

The continued reconstruction of the built environment is vital to the viability of the locality and the firm. The establishment and success of local alliances are critical features underlying the success of industry. The actions of local alliances are important in a number of ways.

First, they are instrumental in the extension of the field of circulation through the construction of physical and social infrastructures. The viability of a city is dependent upon the continued growth of the economic activity taking place there and the size of the city itself. This physical growth frequently requires annexation of surrounding areas or the creation of a supra-regional entity such as a metropolitan area.⁶¹ The aim is "the complete transformation of the hinterland into a dynamic region of industrial and residential expansion".⁶² Through land speculation, property

⁶⁰ Ball, "The built environment and the urban question", pp. 458-461.

⁶¹ Even if formal annexation does not take place the success of a city is usually associated with the emergence of a supra-urban administrative body such as a metropolitan unit comprising the inner city and the surrounding unannexed suburbs.

⁶² Logan and Molotch, Urban Fortunes, p. 182.

developers attempt to increase their return from land rents through active control over land development, housing construction and the building of infrastructure, usually in unison with industry, financial institutions, and the state.⁶³

Second, the continual revolutionizing of the built environment is necessary in order to increase the velocity at which capital circulates. Capital must be channelled into the physical fabric of localities in such a way as to create immediate returns and to present appropriate preconditions for future growth. These preconditions include the development of physical and social infrastructures that will be instrumental in the reproduction of an acceptable and contented labour force, and the necessary physical entities such as roads, sewerage and electricity lines to entice industry and residences. Without such facilities there is little possibility that the continued growth of a city will occur. In already established parts of the city this involves the maintenance and remodelling of existing facilities. More often, the continual updating or even radical changes to the built environment are necessary. In the second half of the nineteenth century the demolition of vast tracts of Paris by Baron Haussmann, the razing of working-class housing in British cities, and the wholesale destruction of New York's neighbourhoods by Robert Moses are testaments to the drastic measures taken to reshape the physical fabric of the city.⁶⁴ In previously unsettled parts of the city or

⁶³ Logan and Molotch, Urban Fortunes; Walker, "A theory of suburbanization", pp. 402-405.

⁶⁴ On Haussmann see A. Sutcliffe, The Autumn of Central Paris. The Defeat of Town Planning, 1850-1970 (Montreal: McGill-Queen's University Press, 1971), chap. 1. For British cities see J.R. Kellett, The Impact of Railways on Victorian Cities (London: Routledge and Kegan Paul, 1969) and Rose "Accumulation versus reproduction in the inner city". A discussion of Moses can be found in M. Berman, All That is Solid Melts into Air (New York: Penguin, 1988).

the adjoining fringes the construction, from scratch, of roads, railway lines, housing, sewers, electricity and the such like is a fundamental prerequisite for further development. Just because these preconditions exist, however, does not mean that urban expansion will occur, but without them it would be impossible.

Third, they establish the basis for the development of industrial districts through the creation of viable land development processes. Firms, as we have already seen, by their nature have a number of linkages external to themselves, many of which exist at the local level such as markets, labour, raw materials and final products, as well as face-to-face contacts. To the extent that these linkages are local, firms are locally dependent. Their dependence revolves around the fixed location of the built environment and the difficulty of substituting the more distant for the local linkages. The spatial immobility of the local environment in which firms function is subject to devalorization, and local linkages are not always stable. A principal aim of firms is to minimize this uncertainty within the geographically limited built environment in which they operate. While they can sometimes reduce the dependence by renting space instead of building, or by spreading the risks over several locations, a firm's principal aim, if it has large existing amounts of fixed capital or if a locality has facilities that cannot be substituted for elsewhere, must be "in defending or enhancing the flow of value through a specific locality".⁶⁵ Local alliances are responsible for the success or failure of this endeavour.

The active construction of place is, therefore, a fundamental prerequisite for

⁶⁵ Cox and Mair, "Locality and community", p. 310.

successful capitalist growth. Because of this the development of urban local alliances is essential to the maintenance of existing industrial districts, the development of 'greenfields' for new productive activities, the creation of necessary infrastructure, the construction of housing, and the building of facilities for the reproduction of the labour force. Although the different factions of these alliances forge common growth strategies, there is often intense conflict between them. Their competition usually revolves around the form that the built environment should take.⁶⁶ When a decline in locally-generated resources occurs, as a result of the movement of industrial and financial capital out of the city, this conflict is intensified.

Economic growth creates increased demand for new work sites, the re-development of existing buildings, and the provision of new forms of infrastructures. The ability of local alliances to provide these facilities, however, is constrained by a number of factors. Structural redevelopment was hindered by the physical durability of buildings, the high cost of making improvements, property owners who were disinterested in making structural changes, imperfections in the market, and technological barriers.⁶⁷ The development of vacant land for new manufacturing districts also faced a set of constraints. A central location was of great importance for firms for two main reasons. First, the need to be located close to working-class housing. The inability of workers to be able to traverse large distances, especially before the advent of cheap mass transit and the reduction in the number of hours

⁶⁶ Ball, "The built environment and the urban question", pp. 456-457 and Harvey, The Limits to Capital, pp. 419-421.

⁶⁷ Rosen, The Limits of Power, chaps. 2-4.

worked, greatly restricted the ability of land developers to assemble new industrial districts.⁶⁸ This was compounded by the fact that a central location was a necessity to families with more than one wage earner as family members needed the most accessible residence to the largest number of job opportunities. Second, the need of businesses for access to the agglomeration economies that were concentrated in the core. On top of this, the monopoly control exercised by land owners alongside the barriers set up by governments hindered the land assembly process. Great amounts of capital, time and commitment were needed for the development of vacant land, and this was not necessarily forthcoming.

4.5 Conclusion: a Range of Industrial Districts

From this discussion of the role of divergent productive strategies, the restructuring of industry and space over time, and the social construction of the built environment, it is possible to point to the existence of many different forms of industrial districts in the nineteenth and early twentieth-century city. The multiple cross-currents generated by the uneven development of technology, the labour process and firm organization allowed for the emergence of a distinct array of industrial space. The structural forces inherent within the material and social properties of industries restricted the parameters for the creation of industrial space: for example, the necessity to locate close to transportation routes remained a critical

⁶⁸ This problem was partially solved by the development of working-class suburbs from as early as the mid-nineteenth century. See Lewis, "The segregated city".

concern of almost all firms. At the same time, production formats functioned within a socio-political environment in which the activities and decisions of a myriad of actors could establish a variety of locational possibilities. In the nineteenth century, rather than one dominant central district, the locational possibilities open to manufacturers gave rise to a series of industrial complexes which were generated by powerful economic dynamics and a conflictual political and social context regulated by economic cycles.

The range of manufacturing districts in the nineteenth century can be illustrated by three examples. The first industrial district, exemplified by the central manufacturing district and characterized by the clothing industry, was geared to the short-term fluctuations of industries dependent upon access to the wholesalers, jobbers and retailers of the central core, a new immigrant labour force, and simple technological needs. Such "market-dominated" firms remained centrally located, small in scale, and labour intensive. Montreal's nineteenth-century clothing industry, for example, was organized by the wholesale dry goods merchants. Plugging into the growing national market, they were able to invest capital captured from their commercial pursuits into ready-made clothing production. Through outwork and contracting they were able to avoid investing in high fixed costs, and to take advantage of an existing cheap labour force. Their overhead costs were kept to a minimum as there was low fixed capital in machinery and space. In the second type of industrial district small-scale firms were clustered around a few large-scale firms which had implanted large chunks of fixed capital into the urban landscape. Once

established, these large firms generated externalities that acted as magnets to smaller firms. All firms benefited from strong backward and forward linkages. As they grew, large-scale, capital-intensive firms generated their own agglomeration economies in non-central locations. In the mid-nineteenth-century, the Lachine Canal area of Montreal was characterized by the juxtaposition of numerous smaller firms with more technologically-advanced large firms. Machine shops clustered close to the huge Grand Trunk Railway shops and the rolling mills; cooperages and sawmills developed close to the harbour. A third industrial district was the 'artisanal' type where a number of small handicraft workshops serving local markets were located in the crannies of a largely residential neighbourhood. In the small workshops, 'master' artisans operating within a relatively traditional context employed few workers and little or no machinery and steam power. The Montreal ward of Saint-Jacques was such a district. In 1871, as one writer states, Saint-Jacques "existed as an almost pre-industrial artisanal enclave in the changing city".⁶⁹

Without the expansion and restructuring of the spatial character of the city the expansion of productive activities cannot take place. However, we cannot assume that the city will grow in the way that industrial capital dictates. Production and the construction of the built environment are both independent of, and dependent upon, each other. The question is how are they linked? There is little doubt that the relationship is a dialectical one: there is no one-way path in which one gives rise to the other. On the one hand, the expansion of productive activities sets into motion

⁶⁹ Bradbury, "The family economy", p. 74.

a string of multipliers upon transportation facilities, urban services, housing, and so on.⁷⁰ On the other hand, the construction of specific places - both cities and areas throughout cities - through the efforts of growth machines is an essential component in the locational and growth strategies of firms. The building and consumption of the built environment is shot through with contradictory and conflicting uses. Dimensions of class and ethnicity, conflict between the factions of the financial, industrial and construction elite, political strategies, and the role of the state ensure that the built environment is not a mere mirror of production. Furthermore, the building and consumption of the built environment is generated by the activities of local alliances who are not only living in the present but whose actions are structured by the past and who look towards the future. Just because various components of the built environment may be necessary to production, the reproduction of labour power, and the circulation of capital, does not mean that it will be built or that the forms that it will take are self evident.

I have suggested that one way to untangle the multiple processes underlying the formation of industrial districts in the city is through the examination of the spatial implications of production formats, waves of growth, and the actions of local alliances. Each industrial district has a distinct set of features (or profile) associated with it such as a distinct array of production formats; particular forms of land development; a variety of physical and social infrastructures; and a different relation

⁷⁰ A. Pred, The Spatial Dynamics of U.S. Urban-Industrial Growth, 1880-1914. Interpretative and Theoretical Essays (Cambridge: M.I.T. Press, 1966).

to waves of restructuring over time. Looking at the industrial geography of cities through the windows of production formats and industrial districts provides a number of advantages. First, it presents an escape from the dualistic character of, on the one hand, core and periphery locations, and on the other, large and small firms. Second, it provides some links between the broad generalizations of long-term changes associated with the long wave and the specificity of localities. Third, it enables us to ensure that explanation is not reliant upon a single explanatory framework: that is, it presents an alternative to the view that the economic is the mainspring of industrial geography. Lastly, it places at centre stage the question of the relationship between society and space.

CHAPTER 5 INDUSTRY AND SPACE IN MONTREAL, 1851-1881

5.1. Expansion of Industry in Montreal

It is but a short time ago that Montreal was compelled to depend upon the workshops of other countries for nearly every mechanical appliance of which she stood in need. Fortunately, however, this state of things has passed away, and, at present, not only is this city independent of almost all the staples of foreign industry, but is able to make, as well as to export, what she was formerly obliged to import and to consume.¹

While the writer of Montreal Business Sketches was dealing in the every-day practice of nineteenth-century boosterism, there was a kernel of truth to his inflated praise of Montreal's industrial development. For in the years after the late 1840s Montreal became an important industrial centre: its industrial, commercial and financial networks reached out to all parts of Canada, the United States and other parts of the world economy. Before 1850, as an element in the British imperial division of labour, Montreal was an important commercial city; exporter of primary goods and importer of manufactured goods from Britain and, increasingly, the United States. Montreal's role as an imperial entrepot did not mean that it lacked a manufacturing base; as early as the 1820s, it manufactured for local markets,² and in the late 1840s its industry reached out to national and international markets. A critical factor behind the widening of Montreal's markets was the reorganization of the city's position within the imperial division of labour. The repeal of the Corn Laws

¹ Canada Railway Advertising Company, Montreal Business Sketches (Montreal: M. Longmoore and Company, 1864), p. 1.

² For a discussion of the importance of manufacturing in Montreal in the 1820s and 1830s see R. Sweeney, "Internal dynamics and the international cycle: questions of the transition in Montreal, 1821-1828" (Ph.D. thesis, McGill University, 1985).

and the Navigation Act in the 1840s forced merchants to seek other profit-making avenues.³ From the late 1840s to the early 1870s the world economy expanded rapidly.⁴ With the dismantling of the colonial system in Canada, the country became increasingly integrated into the wider international economy. From 1850 to 1870 Canada's population rose at an annual rate of more than two per cent and exports increased from \$17 to \$67 million.⁵

Growth of the national economy meant the expansion of a market for Montreal products. Within close distance of the city, rising demand and growing productivity of farms in the Montreal plain created demand for the city's importers and its industrial producers, like Charles-S raphin Rodier who sold threshing machines, manufactured at his agricultural implement factory at the Lachine canal to local farmers with mortgages as security.⁶ Montreal's industrialists also captured a large share of the rapidly growing national demand for shoes, flour, clothing, sugar and metal goods. It has been estimated that seventy-five per cent of the shoes

³ J. Hamelin and Y. Roby, Histoire  conomique du Qu bec, 1851-1896 (Montr al: Fides, 1971); G.J.J. Tulchinsky The River Barons: Montreal Businessmen and the Growth of Industry and Transportation, 1837-1853 (Toronto and Buffalo: University of Toronto Press, 1977); J. Willis, The Process of Hydraulic Industrialization on the Lachine Canal: Origins, Rise and Fall (Ottawa: Environment Canada, 1987).

⁴ D.M. Gordon, R. Edwards and M. Reich, Segmented Work, Divided Workers (New York: Cambridge University Press, 1982), pp. 49-54; E. Mandel, Late Capitalism (London: New Left Books, 1975), chap. 4; R. Walker "The transformation of urban structure in the nineteenth century and the beginning of suburbanization" in K. Cox (ed.), Urbanization and Conflict in Market Societies (Chicago: Maaroufa Press, 1979), pp. 165-212.

⁵ M. Lamontagne, Business Cycles In Canada (Ottawa: Canadian Institute for Economic Policy, 1984), pp. 101-102; Hamelin and Roby, Histoire  conomique.

⁶ P-A. Linteau, "Charles-S raphin Rodier" in Dictionary of Canadian Biography, (Toronto: University of Toronto Press, 1982), vol. 11, p. 763.

consumed in Canada in 1872 were manufactured in Montreal.⁷ A continent-wide market emerged slowly after the late 1840s. In 1856, for example, two of the city's largest fur hat manufacturers exported more than three-quarters of their produce. With the Civil War (1861-1865) the sale of ready-made clothing expanded greatly to the United States.⁸

The ability of Montreal to penetrate the expanding markets of its rural hinterland, Upper Canada, and the United States was made possible by larger flows of capital into industry, transportation and communications. Foreign investment in many sectors of the Quebec economy such as the railways and telegraph accelerated industrial expansion.⁹ The tremendous growth of the railway network, centred in Montreal, helped break down local markets and created national markets for a wide range of products. The establishment of the Montreal Telegraph Company in 1847 further tied Montreal's commercial and industrial sectors into a wider market: as early as 1856 the company's range was over 2,000 miles and connected Montreal to

⁷ Celebration Committee of the Grand Trunk Railway, Montreal in 1856 (Montreal: Lovell, 1856); Hamelin and Roby, Histoire économique, p. 263; J. McCallum, Unequal Beginnings: Agriculture and Economic Development in Quebec and Ontario Until 1870 (Toronto: University of Toronto Press, 1980), pp. 83-96; G.L. Teal, "The organization of production and the heterogeneity of the working class: occupation, gender and ethnicity among clothing workers in Quebec" (Ph.D. thesis, McGill University, 1986), pp 162-198.

⁸ Celebration Committee, Montreal in 1856, p. 46; Hamelin and Roby, Histoire Economique, pp. 76, 268-269; H.C. Pentland, "The role of capital in Canadian economic development before 1875", Canadian Journal of Economics and Political Science, 1950, 16, pp. 457-474; Teal, "The organization of production", pp. 162-198.

⁹ Hamelin and Roby, Histoire économique; Pentland, "The role of capital".

points in Canada and the United States.¹⁰ These technologies take the form of 'built capital', built into the landscape and shared by many users. We shall see later in this chapter the importance of the new material landscape in the creation and definition of productive spaces. Commercial and industrial capitalists have often been presented as different sets of people with rival interests, and the 'transition' from commercial to manufacturing capital might be taken to mean a decline in the role of commercial capital. In the case of Montreal (and, I think more generally in North American cities in this period), the two forms of capital nourished each other, and were often deployed by the same individuals. We shall later see the active collaboration of the several forms of capital in the formation of new productive strategies and productive spaces.

A major actor in the creation of the built capital of railways and telegraphs was the state. While the sources and motivation for investment were heavily commercial and speculative, the state created landscape assets for industry.¹¹ We shall see the importance of these assets, as well as the importance of state intervention, in the creation of local productive spaces. It is important to appreciate the extent to which the new national government was dominated by Montreal capitalists. In such a context they could orchestrate the interventions of both the national and the local state.

¹⁰ P. Craven and T. Traves, "Canadian railways as manufacturers, 1850-1880", Canadian Historical Association, Historical Papers, 1983, p. 254; Pentland, "The role of capital", p. 463; Hamelin and Roby, Histoire économique, pp. 300-301.

¹¹ T. Naylor, The History of Canadian Business, 1867-1914 (Toronto: Lorimer, 1975), vol. 1, pp. 23-27 and chap. 8.

A third major source was capital accumulated by the Montreal bourgeoisie in the colonial commerce system which was channelled into banking, transportation and industry. Local merchants, for example, such as Frothingham, Workman, Morland and Watson deployed capital accumulated from their wholesale hardware businesses into rolling mills, nail factories and edge tool manufacture. The shift into manufacturing by some artisans and the arrival of immigrant industrialists further resulted in the accumulation of capital in the city's industry. Particularly important was the technological know-how and capital brought by British and American immigrants to sectors such as metal and tobacco.¹²

By the 1850s the basic structure of a capitalist labour market had been created in Canada. Two major groups constituted Montreal's first proletariat. Unskilled famine Irish and skilled British immigrants made up the first group, while French Canadians who, dislocated from agriculture and the closure of rural industrial enterprises, streamed into Montreal from the surrounding parishes made up the other.¹³ These groups formed the basis of Canada's first urban-industrial labour market. Women and children were integrated into the industrial workforce: in 1871, one third of the Montreal labour force were women, and one quarter of all boys

¹² Hamelin and Roby, Histoire économique, pp. 369-370; Tulchinsky, The River Barons; Willis, The Process of Hydraulic Industrialization.

¹³ McCallum, Unequal Beginnings; H.C. Pentland, "The development of a capitalistic labour market in Canada", Canadian Journal of Economics and Political Science, 1959, 25, pp. 450-461; B. Ramirez, On the Move: French-Canadian and Italian Migrants in the North Atlantic Economy, 1860-1914 (Toronto: McClelland and Stewart, 1991), chap. 3; Willis, The Process of Hydraulic Industrialization; B. Young and J.A. Dickinson, A Short History of Quebec: A Socio-Economic Perspective (Toronto: Copp Clarke Pitman, 1988), pp. 104-114.

between the ages of 11 and 14 were at work.¹⁴

To summarize, central to the rise of Montreal as the primary industrial complex of Canada was its insertion into the international economy, its capture of expanding markets, massive investments in infrastructure built into the landscape, and the availability of an industrial labour force. The harnessing of these assets for manufacturing involved the creation of new production formats for the application of new manufacturing technologies, new ways of organizing labour and new distributional methods.

5.2 New Production Formats and Manufacturing Strategies

Great progress in [glass] manufacture has been made in the last ten or twelve years, blowing by compressed air having greatly increased the quantity and variety of the work that can be produced while improved methods of moulding have made possible castings of larger size.¹⁵

In the mid 1840s, Montreal's manufacturing base was based on handicraft production in small workshops, each operated by artisans who employed a small number of apprentices and journeymen. There were few machines, little motive power and the market was predominantly local. In the span of years we are considering, handicraft production was largely superseded by the new systems of production which Marx distinguished as "manufacture" and "large-scale industry", as

¹⁴ B. Bradbury, "The family economy and work in an industrializing city: Montreal in the 1870s", *Canadian Historical Association, Historical Papers*, 1979, pp. 71-96; D.S. Cross, "The neglected majority: the changing role of women in nineteenth-century Montreal" in G.A. Stelter and A.F.J. Artibise (eds.), *The Canadian City* (Toronto: McClelland and Stewart, 1977), pp. 255-281; Young and Dickinson, *A Short History of Quebec*, p. 124.

¹⁵ *Canadian Architect and Builder*, April 1895, p. 57.

the example of glass manufacture implies. Under manufacture, the division of labour was broken down "into its separate components, by specialization of the instruments of labour, by the formation of specialized workers and by grouping and combining the latter into a single mechanism".¹⁶ Under large-scale industry, a more developed stage, "the instruments of labour are converted from tools into machines".¹⁷ There is little reason to believe, however, that firms moved steadily and straightforwardly along a path through successive stages from handicraft, manufacture, and large-scale industry. At any given moment, Montreal manufacturers were deploying a variety of productive strategies, and displayed a considerable range of production formats, differentiated by scale, degree of mechanization, and social organization. This part of the chapter presents evidence for the range of formats and the diverse array of productive strategies allied with them between 1850 and 1880.

Different trajectories of growth

After the late 1840s the size of the city's industrial base increased greatly, and with respect to the size of firms, we see leaps in the average and maximum size from one decade to the next. According to the water tax rolls of 1861 there were 631 manufacturing firms inside the city limits (Table 5.1). Over the next twenty years this number doubled: the census of 1881 reports almost 1,300. Growth was, of course, uneven. As Figure 5.1 indicates there were major differences in the rent values of

¹⁶ K. Marx, *Capital* (New York: Vintage Books, 1977), vol. 1, p. 486.

¹⁷ Marx, *Capital*, vol. 1, p. 492.

TABLE 5.1
MANUFACTURING FIRMS BY SECTOR IN MONTREAL, 1861-1881

	Rental Valuation 1861				Census Data					
	# of Firms	Aggregate (\$)	Mean (\$)	Median (\$)	# of Firms	1871 # of Employees	Value of Produce (\$,000)	# of Firms	1881 # of Employees	Value of Produce (\$,000)
Clothing	81	27,956	345	280	238	3,678	4,163	329	8,573	7,415
Food	84	21,546	256	60	68	849	7,515	96	1,376	12,204
Metal	51	19,858	389	280	105	3,013	3,418	126	3,976	5,099
Leather	102	18,086	177	100	166	5,781	6,685	233	6,601	9,986
Transportation	38	14,150	372	66	41	513	569	45	1,604	2,038
Wood	79	12,314	156	80	92	1,209	1,978	120	1,448	2,123
Beverage	20	10,684	534	125	11	293	757	17	357	1,003
Chemical	21	4,438	211	160	30	185	1,060	40	547	2,294
Printing	23	5,160	224	140	45	1,016	837	53	1,549	1,619
Blacksmith	64	2,842	44	40	49	163	131	49	98	93
Miscellaneous	15	2,520	168	120	61	876	1,036	53	658	958
Non-Metallic	21	2,268	108	100	30	625	577	27	836	732
Rubber	2	2,000	1,000	1,000	1	370	431	2	414	680
Textile	9	1,920	213	100	18	246	247	17	389	337
Jewellery	16	1,670	104	80	26	140	163	31	218	410
Tobacco	3	950	317	350	17	1,110	1,246	22	2,293	1,637
Paper	2	120	60	60	1	67	80	17	637	1,068
City	631	148,482	235	100	997	20,134	30,893	1,277	31,574	49,696

Note: The construction figures from the 1871 and 1881 censuses have been excluded from the table. I aggregated all firms from the rôle d'évaluation for 1861 into sectors, and then matched the census material to the rent data.

Source: City of Montreal, Rôle d'évaluation, 1861; Canada, Census of Canada, 1870-1871 (Ottawa: I.B. Taylor, 1875), vol. 3; Canada, Census of Canada, 1881 (Ottawa: Maclean, Rogers and Co., 1883), vol. 3.

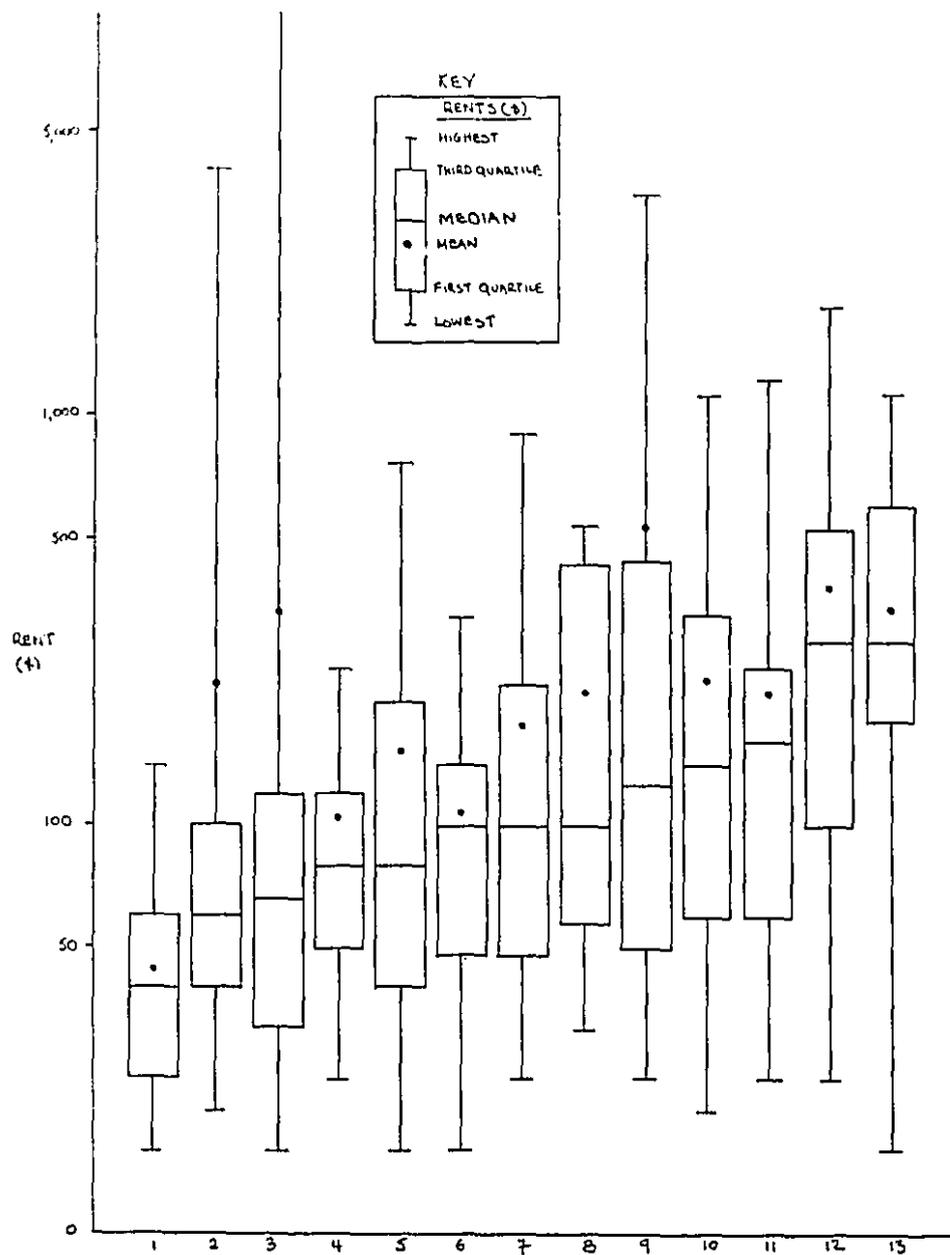
sectors in 1861. As is shown in Figure 5.1 sectors with low median rents (\$40 to \$80) were blacksmithing, transportation equipment, food, jewellery and wood, while the clothing, metal and chemical sectors had much higher median rents (greater than \$160). As we shall see below, however, the differences in sectoral rents, while providing us with one cut into the structure of industry, needs to be backed up by more detailed analysis of individual industries and firms.

In the wave of economic growth that swept Montreal in the 1850s, the leading sectors of growth were food processing, metal, leather and transportation equipment. Over the next two decades these sectors would continue to be the engines of Montreal's industrial growth. These sectors were transformed through the restructuring of the social organization of production, as a result of some combination of the introduction of new technologies, and the increasing division of labour. Moreover, the ability of Montreal's industrialists and merchants to tap the growth of both local and non-local markets added to the general cumulative process.

No single sector dominated. In 1861 clothing accounted for almost nineteen per cent of rents of all manufacturing establishments, followed by food, metal and leather.¹⁸ In 1881, these four sectors were still the largest in terms of their output, but rates of growth over the preceding two decades were higher in the printing, tobacco and paper industries: the number of printing firms doubled (twenty-three in 1861, fifty in 1881), and employed more than 1,500 workers. The tobacco industry

¹⁸ The sector by rent table (Table 5.1) has a number of problems. The major one is that it is impossible to verify the importance of manufacturing for individual firms in a number of industries. As many firms combined retailing, importing and manufacturing functions, it was very difficult to separate non-manufacturing from manufacturing firms.

FIGURE 5.1
BOX PLOTS OF MONTREAL MANUFACTURING RENTS BY SECTOR, 1861



- | | | |
|--------------------------|-----------------|---------------|
| 1. Blacksmithing | 6. Non-Metallic | 11. Chemicals |
| 2. Food | 7. Leather | 12. Metal |
| 3. Transportation Equip. | 8. Textile | 13. Clothing |
| 4. Jewellery | 9. Beverage | |
| 5. Wood | 10. Printing | |

Source: City of Montreal, Rôle d'évaluation, 1861.

also grew steadily over the period. The paper industry, new in the 1870s, by 1881 had seventeen firms employing 637 workers and a million-dollar output.

In food processing, sugar and flour refining illustrate one trajectory, that of large fixed capital and mechanization. In terms of value the sugar industry was one of the leading sectors by 1871. Montreal had two plants. The larger was Redpath Sugar, established in 1855 and, for a while, the largest factory in the city. In 1867 the two sugar companies together had capital of over \$1 million; in 1881 they employed one-third of all food-processing employees and accounted for almost fourteen per cent of the city's total value of production.¹⁹ The flour industry was also extremely capital-intensive and five firms accounted for over six per cent of the city's total value in 1871; in 1866 the four flour mills along the Lachine canal manufactured more than 190,000 barrels of flour, while by 1875 it had increased to almost 395,000.²⁰

Growth sectors were not necessarily linked solely to the introduction of new and sophisticated forms of technology. Growth could occur in other ways. Equally important was the reorganization of production and the reshaping of the division of labour. This meant that there were differences in terms of industries' labour content

¹⁹ Celebration Committee, Montreal in 1856, p. 40; Canada, Census of Canada, 1880-81 (Ottawa: MacLean, Roger and Co., 1883), vol. 3; Hamelin and Roby, Histoire economique, p. 263.

²⁰ Canada, Census of Canada, 1870-1871, (Ottawa, Taylor, 1875), vol. 3, p. 323. The figures for 1866 production come from the report of J.G. Sippell, the Lachine canal's superintendent, in Canada, General Report of the Commissioners of Public Works for the Year Ending 30th June, 1867 (Ottawa: Hunter, Rose & Co., 1868), Appendix 51, p. 422. The 1875 figure is taken from W.J. Patterson, Statements Relating to the Home and Foreign Trade of the Dominion of Canada. Also, Annual Report of the Commerce of Montreal for 1875 (Montreal: Gazette Printing House, 1876), p. 91.

and processes, degree of mechanization, and extent of fixed and working capital. The classic case in Montreal is the shoe industry where the intensification of the division of labour before 1850 laid the basis for the deskilling of artisan shoemaker and for the burst of mechanization which took place in the 1850s. The making of shoes was relatively simple: it was the breaking-up of production into an increasing number of steps that underlay the transformation from artisan shop to the factory.²¹ Even by the 1870s when a small number of firms controlled a large proportion of the industry's production and mechanization was highly advanced, "the largest part of the work on boots is still done by hand".²²

Sectors that were undergoing rapid growth did not necessarily follow one vector of growth. The technological and social character of a sector could be splintered in such a way that there were many different paths for success. Metal was an extremely diverse sector. Established in conjunction with the shipbuilding industry in the second decade of the nineteenth century, the sector experienced dramatic growth after 1851; by 1881, as Table 5.1 shows, 126 metal firms employed nearly 4,000 workers. The metal sector was highly diverse, ranging from small specialized machine shops through nail factories, lead pipe firms to large rolling mills. Much of the growth was based on the expansion of the transportation equipment sector which

²¹ J. Burgess, "L'industrie de la chaussure à Montréal: 1840-1870 - le passage de l'artisanat à la fabrique", Revue d'histoire de l'Amérique française, 1977, 31, pp. 187-210.

²² G. Boivin's evidence in Canada, House of Parliament, "Report of the Select Committee on the causes of the recent depression of the manufacturing, mining, commercial, shipping, lumber and fishing interests", Journals, (Ottawa, MacLean, Roger and Co., 1876), Appendix 3, p. 98. Burgess, "L'industrie de la chaussure".

appeared in the early 1850s, especially the Grand Trunk Railway shops at Point Saint-Charles which were Canada's first large-scale, vertically integrated production site.²³ In 1854 the plant consisted of locomotive erecting shops, car erecting shops, a smith shop and a foundry, as well as a number of non-manufacturing buildings. In 1856 a saw mill was added. As the locomotive superintendent observed in 1857, the shops "have no equal either in extent or in completeness of arrangement on this side of the Atlantic".²⁴ While several large and mechanized metal-working firms developed after 1850, labour remained relatively untransformed; for example in the foundries and machine shops, skilled craftsmen remained indispensable through their control over the labour process, and moulders and machinists "tended to work on their own".²⁵

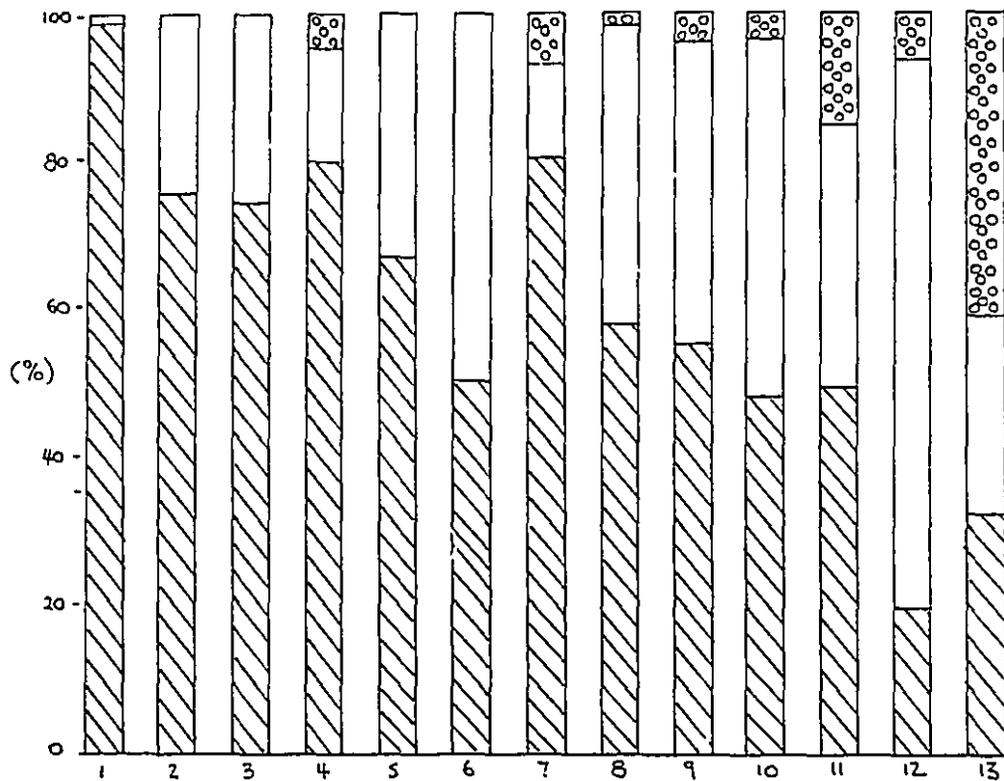
The range of sizes of firms is displayed in Figure 5.2 which shows the distribution of sizes of firms in each manufacturing sectors in 1861, as indicated by their manufacturing rent values. While nearly one metal establishment in five had a rent of at least \$800 (eight times the city median), one in three was valued below \$144. In contrast to this, sectors such as food processing, transportation equipment, blacksmithing and jewellery had three-quarters or more of their firms in the two

²³ Craven and Traves, "Canadian railways as manufacturers".

²⁴ The superintendent was quoted in Craven and Traves, "Canadian railways as manufacturers", p. 270.

²⁵ The quote is from W. Kilbourn, The Elements Combined: a History of the Steel Company of Canada (Toronto: Clarke, Irwin, 1960), p. 24. For a discussion of these issues with regard to Montreal moulders see P. Bischoff, "La formation des traditions de solidarité ouvrière chez les mouleurs montréalais: la longue marche vers le syndicalisme", Labour/Le Travail, 1988, 21, pp. 9-43 and "Des forges du Saint-Maurice aux fonderies de Montréal: mobilité géographique, solidarité communautaire et action syndicale des mouleurs, 1829-1881", Revue d'histoire de l'Amérique française, 1989, 43. 1, pp. 3-29.

FIGURE 5.2
DISTRIBUTION OF SIZES OF RENTS IN SECTORS BASED
ON THEIR MANUFACTURING RENTS, MONTREAL 1861



- | | | | | |
|----------------|----|-----------------------|-----|----------|
| <u>Sectors</u> | 1. | Blacksmithing | 8. | Leather |
| | 2. | Non-metallic | 9. | Printing |
| | 3. | Jewellery | 10. | Chemical |
| | 4. | Transportation Equip. | 11. | Beverage |
| | 5. | Wood | 12. | Clothing |
| | 6. | Textile | 13. | Metal |
| | 7. | Food | | |

- | | | |
|------------------------|---|----------------|
| <u>Rent categories</u> |  | \$0-140 |
| |  | \$141-799 |
| |  | \$800 and more |

Source: City of Montreal, Rôle d'évaluation, 1861.

lowest rent categories. For 1871 we can use census data. Although the 1871 census gives a mean of nineteen workers and capital investment of \$10,119 per firm, these averages hide the large scale typical of some industries and some firms (Table 5.2). Industries such as sugar refining, flour milling, brewing, engine building, and rubber were characterized by larger numbers of workers and capital investment. The locomotive works of the Grand Trunk Railway employed 790 workers in 1871.²⁶ The Redpath Sugar Refinery which opened in 1855 was made up of a seven-storey brick and stone refinery, two sugar warehouses, and a series of buildings which contained a stable, blacksmithing, carpenter and tinsmithing shops, and a gas warehouse valued at \$160,000.²⁷ In contrast to the large-scale and capital-intensive firms, blacksmithing, baking and coopering remained unmechanized, small in scale, and geared to handicraft production.²⁸ With median rents of \$40, \$40 and \$60 respectively in 1861, these three industries were traditional in their manufacturing practices and relatively unmechanized. Between these two extremes were arrayed the city's other industries; where different degrees of mechanization, labour forces were defining features of an industry's and a firm's scale and organizational structure.

In some industries there were enormous differences between firms. The seventeen largest firms in the shoe industry in 1871 (fourteen per cent of all

²⁶ Craven and Traves, "Canadian railways as manufacturers", p. 266.

²⁷ R. Feltoe, Redpath: the History of a Sugar House (Toronto: Natural Heritage/Natural History Inc, 1992); G. Tulchinsky, "John Redpath" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1976), vol. 9, p. 654.

²⁸ Bradbury, "The family economy"; Craven and Traves, "Canadian railways as manufacturers"; Teal, "The organization of production".

TABLE 5.2
FIXED CAPITAL AND EMPLOYMENT IN SELECTED
INDUSTRIES IN MONTREAL, 1871

	A	B		A	B
Rubber	341,423	370	Sash and Door	10,442	25
Sugar	194,269	170	Soap	9,194	6
Engines	61,297	113	Boot and Shoe	8,254	44
Flour	47,811	21	Furniture	5,577	11
Breweries	45,597	24	Bakeries	2,572	6
Tobacco	21,645	65	Clothing	2,234	13
Printing	21,367	30	Coopering	1,216	7
Foundries	17,881	45	Blacksmiths	641	3
Paint	16,473	8	All industries	10,119	19

A = mean fixed capital (\$) per firm

B = mean number of workers per firm

Source: Canada, Census of Canada, 1870-1871, vol. 3.

establishments) accounted for seventy per cent of employees and eighty-two per cent of the shoes produced.²⁹ In some sectors such as fur and hats, firms were generally small in size, but certain firms were large. The fur and hat factory of Green and Son, established in 1832, employed 177 workers in 1856 (mainly women) and had capital to the tune of \$60,000 invested in its four-storey building in the heart of Montreal.³⁰

One of the factors behind the divergence among industries was the uneven application of technology, and we shall see that the uneven rate of the introduction of machinery was in turn related to market options. The introduction of the Hungarian roller process played an important part in the growing scale and concentration of the flour industry. The introduction of packing technology from the U.S. in the 1850s was a strong incentive in the growth of Canada's meat packing industry. Large-scale manufacturing was made possible in the rubber industry by the introduction of the vulcanization and other processes, as well as new machinery.³¹

Although mechanical technology created new possibilities for large-scale production, for the development of new products, for the standardization of production and for new forms of control over labour, the application of such techniques was constrained by the extent of markets, their composition, and

²⁹ Burgess, "L'industrie de la chaussure".

³⁰ Celebration Committee, Montreal in 1856; Canada Railway Advertising, Montreal Business Sketches.

³¹ Canada Year Book, 1922-1923 (Ottawa: Acland, 1924), pp. 444-446; J. Fountain, "The growth of the local enterprise: from J.M. Schneider Ltd to the Heritage Group" in D.F. Walker (ed.), Manufacturing in Kitchener-Waterloo: a Long Term Perspective (Waterloo: Department of Geography Publication Series No. 26, University of Waterloo), p. 87; L. Roberts, From Three Men (np: Dominion Rubber Company Ltd, nd), p. 15.

manufacturers' expectations and estimates of the risks involved. Some industries, such as flour and sugar, through the growing demand for their products, the relatively simple character of their production process, and the ease with which their raw materials could be transformed into finished products, were able to introduce new machines rapidly and with little hindrance, but other industries were hampered by the relatively small extent of the Canadian market. The brass founder Robert Mitchell told an 1876 Parliamentary Committee that if he could, his company "would make articles by the hundreds where we now make them by only tens or twenties", but he was greatly limited by the size of the Canadian market.³² For similar reasons, the machinery making firm of Gardner and Son did not limit their operation to a few types of machines, but instead "manufactured every variety of machines - steam engines, lathes, saw mill machinery, tobacco manufacturers' machinery, bark-mill, letter-copying presses, all kinds of machinists' tools, etc, etc".³³ In contrast to the United States where a large and rapidly expanding market enabled manufacturers to implement productive strategies featuring continuous-processing methods, Canadian manufacturers were forced to adopt batch production methods and to continually change machinery set-up. Furthermore, Canadian firms also had to compete with the larger American firms which had well developed internal economies of scale and scope. Even firms with the potential for large-scale and standardized production were forced to rely on a number of lines rather than one.

³² Canada, "Report of the Select Committee", 1876, Appendix 3, p. 149.

³³ J.D. Borthwick, Montreal, its History to Which is Added Biographical Sketches, With Photographs of Many of its Principal Citizens (Montreal: Drysdale and Company, 1875), p. 146.

The dilemma is well expressed by G.H. Nye of the mammoth Hochelaga Cotton factory in Montreal's east end in 1876:

In the United States there are 875 cotton mills. Some of the mills from the commencement have been running on one style of goods. ... The consequence is that they are able to produce a larger quantity for less money. Here we have run on different styles, and therefore cannot manufacture so cheaply.³⁴

The problems associated with the small extent of the Canadian market were compounded by the fragmentation of demand. For example, the jewellery industry was restricted to a luxury class of consumers. A major debate in the railway industry in this period was over the relative worth of cast iron and wrought iron wheels, and of steel tires.³⁵

It is important in analysing this stage of industrialization, to recognize the risks involved in mechanization, as these affected the options open to, and ultimately, the productive strategies chosen by manufacturers. The risks involved reliability and ease of adaptation to various product lines. Peter Wood, the owner of Montreal's only cotton factory in the 1860s, wrote to his brother John in December 1869,

I now have the wadding machine working well and the grey cottons never were so well made as now ... But it seems as tho there is no end of trouble. This week I have had my 'mules' (spinning machines) break down so as to stop the mill.³⁶

Even when the machines were not breaking down there was the problem of the continual changes that had to be made in order for the machines to function

³⁴ Canada, "Report of the Select Committee", 1876, Appendix 3, p. 130

³⁵ Craven and Traves, "Canadian railways as manufacturers", pp. 275-275.

³⁶ W.A. Wood, The Days of John Wood, Watchmaker (Hudson: Wood Family Archives), pp. 225-226.

effectively. G. Boivin, a shoe and boot maker, told the 1876 committee, [if] a man is making one kind of work he sets the machine to suit it, but if he has to change it a dozen times a day to do the other kinds of work, it cannot be so regular". At the same time, the expense of changing even simple machinery and equipment in response to changing social conditions could be prohibitive. Another boot and shoe manufacturer, E. Mullarky, told the 1876 committee that to compete in the British market, "I must change my lasts and ties and some other things". While he was interested in exporting his goods he did not "consider that it would be worth my while to incur that expense for the present".³⁷

The choice of a production format featuring large scale and a high degree of mechanization meant putting a large working capital at risk, and not all firms had access to large chunks of capital. In Montreal the only firms that had access to and were able to adopt large amounts of machinery were those in growth industries where the material and social features of the industries provided the potential for the restructuring of existing labour practices. In some cases, as in shoe manufacture, capital outlay could be small; large fixed capital investment being achieved through replication of similar machines. In others, a large capital investment was needed from the beginning as machinery was large, specialized and expensive. It should be noted that even those firms adopting large trains of sophisticated machinery could be, and often were, characterized by hand labour at several points of production. The problem of large capital investments was accentuated by the constant up-dating that

³⁷ Canada, "Report of the Select Committee", 1876, Appendix 3, p. 107.

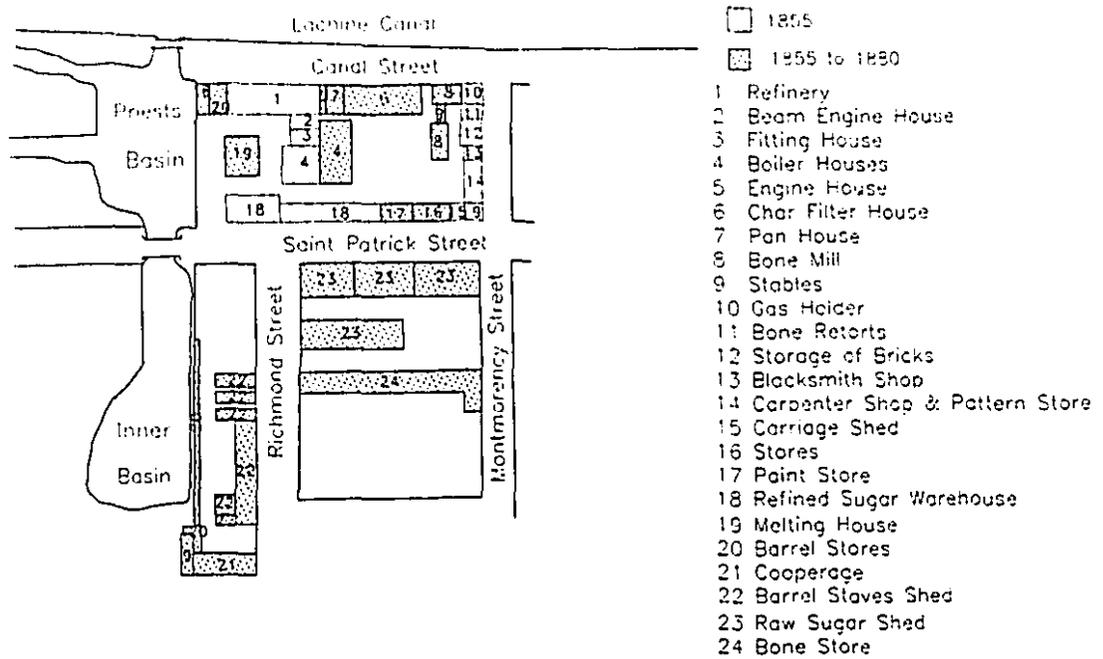
some firms had to perform if they were to remain competitive. Take the case of Redpath Sugar, whose president George Drummond stated with regard to machinery and the refining process, "[w]e are changing the whole time, it is impossible to conduct a business, such as ours, without an enormous expenditure constantly in changes".³⁸ The company also needed capital for expansion of the plant. Between its opening in 1855 and 1880, the Redpath plant was greatly extended as Figure 5.3 indicates. Over the twenty-five years, the plant expanded from a single cluster of buildings between the Lachine canal and Saint Patrick street to the multi-block premises containing three principal groupings of buildings: the refinery and associated buildings on the original site; the raw sugar and bone storage area between Montmorency and Richmond streets; and the cooperage cluster next to the Inner Basin.³⁹

Lastly, difficulties associated with the placing of machinery in a efficient manner within the workplace were hindrances to the full development of a firm's potential. The constricted spaces of the core could be difficult for laying-out larger machines and for the elaboration of the division of labour. Custom-built plants could, on the other hand, quickly become less efficient and possibly even redundant with the introduction of new innovations and new divisions of labour. In Pillow and Hersey's new rolling mill on St-Patrick street "[t]he awkward and dangerous network of belts and pulleys still restricted the lay-out of the plant and hampered the use of

³⁸ Canada, "Report of the Select Committee", 1876, Appendix 3, p. 37.

³⁹ Tulchinsky, "John Redpath", p. 654; Feltoe, Redpath, Appendix 4.

**FIGURE 5.3
EXPANSION OF THE REDPATH SUGAR REFINERY
PLANT, 1856-1881**



Source: Feltoe, Redpath, Appendix 4.

machinery for moving heavy materials".⁴⁰ Although the potential for large-scale production under new forms of social organization was available in mid-century Montreal, the ability of firms and industries to take advantage of it was limited by an array of difficulties associated with the implementation and day-to-day use of machinery, the raising of capital for investment in fixed capital outlays and the extent of the market.

New production formats allowed for a more finely segmented labour force through differentiation by gender, age and ethnicity. With the coming of a new burst of industrial expansion after the 1840s it is, in the words of one writer, "reasonable to suppose that increasing numbers of women were employed in ... factories from the 1850's or possibly earlier".⁴¹ By 1881 women and children accounted for two-thirds of the Montreal rubber industry, more than eighty percent in clothing, sixty percent in tobacco, and forty percent in shoemaking.⁴² The fact that half or more of the work force in industries such as clothing, shoes, tobacco, textiles, and rubber were women and children was due to some combination of the introduction of machinery, the reduction of the craft workers' control over production, the widening of the division of labour and the search for cheap labour.⁴³ Although there were large

⁴⁰ Kilbourn, The Elements Combined, pp. 14-15.

⁴¹ Cross, "The neglected majority", p. 265.

⁴² Calculated from Canada, Census, 1881, vol. 3. For a discussion of the position of women and children in Montreal's work force in the nineteenth century see Cross, "A neglected majority", pp. 265-268.

⁴³ For studies of these combinations in Montreal see Bradbury, "The family economy", pp. 74-76; J. Ferland, "In search of the unbound Prometheia: a comparative view of women's activism in two Quebec industries, 1869-1908", Labour/Le Travail, 1989, 24, pp. 11-44; M. Payette-Daoust, "The Montreal garment

differences in the gender balance of the labour force of industries, there was also a highly segmented division of labour by gender and age within firms. In Peter Crosby's Dominion Type Foundry, for example, the more difficult tasks in the making of font matrices were left in the hands of a small number of men, while a few boys and about fifty girls performed the more mundane and unskilled jobs such as breaking off the "jets" and smoothing the surfaces.⁴⁴ The cotton factory of Frederick Harris produced denim cloth with seventy workers, mainly women and children, on machinery such as willows, pickers, carding and drawing machines, spindles and looms.⁴⁵ While Montreal's industry was divided by gender and age, various studies have shown that Montreal's economy was differentiated along the lines of ethnicity. French-Canadians and Irish constituted the bulk of workers in the unskilled and semiskilled sectors of industry while the British and Americans dominated the skilled sectors.⁴⁶

A variety of production formats

A consequence of the risks and limitations associated with industrialization in Montreal in this wave of capital accumulation was the existence of a variety of

industry, 1871-1901" (M.A. thesis, McGill University, 1986), pp. 100-110.

⁴⁴ Canada, "Report of the Select Committee", 1876, Appendix 3, p. 85; Canada Railway Advertising, Montreal Business Sketches, pp. 18-19.

⁴⁵ G. Tulchinsky, "Fredrick Warren Harris" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1976), vol. 9, p. 367.

⁴⁶ Cross, "The neglected majority"; Bradbury, "The family economy"; Kilbourn, The Elements Combined.

production systems. As I suggested in Chapter Three there was no single trajectory of growth that firms could follow. Montreal's production system was splintered along many lines. Despite the burst of growth that the city enjoyed starting in the late 1840s, the restructuring of old trades and the expansion of others took on a variety of formats that was shaped by an industry's ability to implement new forms of machinery, to instigate different labour practices, to establish new work forces and to connect to outside markets. The adoption of these formats in Montreal revolved not only around the material side of an industry - leather, wheat and sugar beets were more amenable to mechanization than were iron bars - but also to the social organization of production and the problems related to the implementation of machinery. The ability of Montreal metal manufacturers, for example, to organize the labour process was constrained by the power of skilled metal workers. While shoe manufacturers were able to do away with all-round, skilled shoemakers and replace them with unskilled 'operatives', the limited extent of the market reduced their ability to implement the types of internal economies of scale and scope that were common in American factories.

Four production formats were important in this wave of growth. The first, which I call the milling format, was associated with the food processing industries of flour milling and sugar refining. While firms in this format tended to be large and relied on the investment of large chunks of capital into the expansion and remodelling of the plant and the introduction of new technologies, they employed relatively small numbers of workers. The technological bases of the transformation

of grains and raw sugar into flour and refined sugar were well known by the 1850s and the process of manufacturing was relatively simple. The ability of 'milling' manufacturers to capture a large market depended on volume output made from non-local raw materials for a relatively large and standardized market.

A second type of production format was where firms undertook production which revolved around a series of intricate technical and labour processes. The working of the material was difficult and manufacturers relied upon a great deal of precision and skill. Although machinery was common, it was used within the context of the craft system and 'untransformed' labour.⁴⁷ Markets tended to be highly differentiated and few employers had substantial control over the market, although some were able to corner certain specialized niches within the industry. The amounts of capital that were invested in individual firms varied. In some cases, large amounts of capital were invested such as in the city rolling mills, usually by merchants who for a variety of reasons were attempting to integrate the distribution and production ends of the industry. In other cases, capital investment was small: artisans working themselves up to masters and firms specializing in small or varied markets were unable to develop large-scale capital structures. Important examples of this type of production format in Montreal after 1850 were certain branches of metal-working as well as glass and printing where an array of firms made a vast number of products, much of them under craft conditions within the factory system.

⁴⁷ By untransformed labour is meant that while industrialists controlled the capital and made the financial and distributional decisions of the firm, workers retained control over the labour process and relied on traditional methods of production. See Gordon et al., Segmented Work, pp. 79-94.

In contrast to these two types were many firms from the clothing, shoe, rubber tobacco and biscuit trades where labour-power was quickly transformed from being vested in a skilled worker to a 'specialized worker', where simple forms of mechanization created a large army of machine operators. In each of these industries, some form of technological change around the middle of the century transformed the way production took place: vulcanization in rubber; the sewing machine in shoe-making and clothing; and machines in tobacco and biscuits which replaced skilled labour with machine operators. Furthermore, in these industries the product was easily transformed; the introduction of machinery to turn cloth, tobacco, rubber, leather and flour into mass market products being a relatively easy procedure.⁴⁸ One consequence of this was that skilled or male labour was replaced by that of women and children as a means to cheapen costs. The market was often differentiated and seasonal. While machinery remained simple and inexpensive, the result was that entry into the trade was fairly easy as firms become less reliant on skilled labour and needed little capital to start up.

A last example of a production format was the one where artisanal production methods and culture continued to play a major part. Although many trades were under attack - from merchants investing in manufacturing and from artisans who

⁴⁸ By this I do not mean that the skilled workers did not fight to maintain their control over production. As J. Cumber in Working Class Community in Industrial America: Work, Leisure and Struggle in Two Industrial Cities, 1880-1930 (Westport, Conn.: Greenwood Press, 1979) has shown for the Lynn shoemaking industry the transition from artisanal to capitalist production was a difficult and contentious process. Nonetheless, in many respects, shoemakers were fighting a lost battle: the nature of the industry, the intent of the manufacturers and the wider context of economic change would prove to be too strong. It should be noted that this production format includes only certain firms in the mentioned industries. In clothing and shoemaking for example, a small number of firms were employing large numbers of workers under the conditions described here.

became manufacturers - several trades managed to maintain craft traditions. Bakers by the end of the century still laboured under similar conditions to those of fifty years earlier; cabinet-makers working in small workshops of the 1870s and 1880s still used the old tools of the trade.

In the period 1850-1880 industry in Montreal underwent massive changes. These changes took the form of increasing firm scale, the introduction of new industries and the fundamental restructuring of old ones, and the introduction of a wide range of technologies, skill opportunities and production systems. While the period saw a dramatic growth of large and mechanized firms in Montreal, it cannot be said that the large-scale factory dominated the industrial landscape. We have seen the existence of a wide range of production formats differentiated along the lines of scale, capital-intensity, mechanization, labour, and organizational structure. The industrial changes were associated with the reshaping of the city's industrial geography. The new economic configurations established new locational possibilities. It is to Montreal's industrial geography that we now turn, to examine the new productive spaces.

5.3 Restructuring of Urban Space

I was much struck with the continued rapid growth of this now great northern city. Built as it is almost wholly of stone along the extensive and massive quays which line the bank of the river, and in the business portions, Montreal makes a dignified, indeed, an imposing effect. The beholder for the first time, unless marvellously well up in his geography, is surprised to find so large and so complete a city.⁴⁹

The writer's comments in 1868 described a new phenomenon. Although he does not mention manufacturing at all, his description hints at the tremendous change in the city's physical infrastructure which accompanied industrial growth. Large flows of investment into the built environment, orchestrated by the city's economic elite, were instrumental in the development of new productive spaces. Some of the more important features of the new physical fabric created by the collaboration of different capital fractions and the state were the expansion of the harbour, restructuring of water supply, and a reorganization and differentiation of housing stock. These changes were not simple responses to well-articulated demands of industrialists, but arose from the actions of local alliances, and the different forms of capital represented in them. Construction and redevelopment of the urban fabric would ultimately allow for the implantation of new industries, new technologies, new forms of industrial organization, and new living habitats. To illustrate this a brief discussion of the city's harbour and water supply will be presented, followed by the consideration of the development of new residential spaces.

⁴⁹ A comment from a visitor to Montreal in 1868 quoted in Montreal: The Metropolis (Montreal: The Gazette Printing Company, 1907), p. 15.

New infrastructures

In 1830 the government of Lower Canada, under intense pressure from Montreal's merchants, established the Harbour Commission of Montreal in order to organize the financing and to supervise the construction of the new port facilities. The objective was to undermine the advantages of their counterparts in other cities along the Saint-Lawrence and Hudson rivers. Although the intent of the Harbour Commission was to increase Montreal's share of the continent-wide flow of raw materials and manufactured goods, an unintended result was the creation of a physical structure that supported the expansion of Montreal industry. In 1842 the city had less than one mile of piers and a channel to Quebec that had a depth of twelve and a half feet and a width of seventy-five. With the boom of the late 1840s, "les travaux effectués ... ont doté Montréal d'un système de quais qui rivalise avec celui des ports américains".⁵⁰ Over the next three decades waves of investment into the port resulted in extensive construction: by the end of the 1870s there were four miles of piers which handled one and half millions tons of cargo, and the dimensions of the channel had been extended to twenty-five by three hundred feet. Controlling the Commission and supervising its work were a small number of men who represented the city's most important business organizations and who had interests in all facets of Montreal's business world: men such as John Young had interests in the railways, telegraph companies, shipping, insurance, and banking and represented the western

⁵⁰ Hamelin and Roby, *Histoire économique*, p. 22.

section of the city at city hall.⁵¹

Another important aspect of the reproduction of the city's labour force, firms and productive spaces was the development of an adequate water supply. For the first half of the nineteenth century, water supply in Montreal grew fitfully and as conditions dictated; a comprehensive system was not put in place until the late 1850s. While water companies throughout North America were forced by a growing population and problems of sanitation to implement new schemes and to extend their coverage, a primary concern was fire protection. Manufacturers, like owners of large commercial properties, were concerned with the impact of water supply on fire insurance costs. For municipalities, a chief concern was the maintenance of a viable built environment for economic and property interests and the reduction of the costs incurred after a fire.⁵² In Montreal a private water company was established in 1801; but it was purchased by the city in 1845 as "private management of the water supply of a city is always more or less unsatisfactory", and made substantial new

⁵¹ R. Blanchard, *L'Ouest du Canada français: Montréal et sa région* (Montréal: Beauchemin, 1953), pp. 247-249; P. Brouillard, "La Commission du Havre de Montréal (1850-1896)" in Société historique de Montréal, *Montréal: Artisans, Histoire, Patrimoine* (Montréal: Fides, 1979), pp. 83-102; Hamelin and Roby, *Histoire économique*, pp. 106-110; J-C. Marsan, *Montreal in Evolution* (Montreal: McGill-Queen's University Press, 1981), pp. 170-172; G. Tulchinsky and B. Young, "John Young" in *Dictionary of Canadian Biography* (Toronto: University of Toronto Press, 1972), vol. 10, pp. 722-728. In this period the Harbour Commission was, for the most part, controlled by anglophones. Of the fifty-seven nominations between 1850 and 1896, two-thirds were anglophone. The nineteen francophones did include important members of Montreal's business elite such as J-L. Beaudry who was part of a group consisting of William Workman, Thomas Cramp and A-M. Delisle, and who was involved in the Montreal and Bytown Railway Company, the Jacques-Cartier Bank and the New City Gaz Company. See Brouillard, "La Commission du Havre de Montréal", pp. 91, 96.

⁵² L. Anderson, "Water-supply", in N.R. Ball (ed.), *Building Canada: a History of Public Works* (Toronto: University of Toronto Press, 1988), pp. 195-200.

investments.⁵³ The great fire of 1852 which destroyed a large part of the water system as well as more than 1,100 houses (about fifteen per cent of the housing stock) provoked construction of a new water system.⁵⁴ Based on a plan drawn up by Thomas Keefer, the new waterworks which was opened in 1856 consisted of a four and a half mile aqueduct that began above the Lachine Rapids and ended below the Rapids at Pointe-Saint-Charles. In 1859 a new reservoir with a capacity of three million gallons was put into service at what is now Saint-Louis Square. Very quickly, however, increased demand could not be met by the antiquated system, and at the end of the 1860s a steam-driven pumping system was installed, while another crisis led to further investment and the creation of a new scheme ten years later.⁵⁵

The example of the Harbour Commission and the takeover of the water system by the city illustrate the importance of local growth machines allied with the state in the reshaping of Montreal's landscape. As the city grew there was a growing demand for the creation of heavier-duty infrastructures, which in turn relied upon the investment of large lumps of capital. As the private sphere was unable or unwilling to finance these infrastructures, the various levels of the state, because of

⁵³ W.D. Lighthall, "City government" in A. Shortt and A.G. Doughty (eds.), Canada and its Provinces (Toronto: Glasgow, Brooke and Co., 1914), vol. 15, pp. 309-310.

⁵⁴ Procédés du Comité général de secours nommé par les citovens de Montréal pour venir en aide aux victimes du grand incendie des 8 et 9 Juillet 1852 (Montreal: John Lovell, 1853) and Second rapport du comité exécutif du Comité de secours de Montréal présenté au Comité de secours le 18 octobre 1852 (Montréal: La Minerve, 1853).

⁵⁵ Anderson, "Water-supply", pp. 202-203; A.E. Doucet, "History of the Montreal Aqueduct", The Journal of the Engineering Institute of Canada, 1921, 4, 12, pp. 601-605; Lighthall, "City government", pp. 309-310. The financing of the new reservoirs was the reason for creating the new 'water tax' roll from which I draw the rent data for 1861 and 1890.

their access to large amounts of capital, became the major provider of critical infrastructures. Just as importantly, the state coordinated infrastructural development through its control and mobilization of resources, its supervision of the ideological content of the debates surrounding and the rules of the groups controlling infrastructures, and its choice of which aspects of urban growth it should intervene in. One unintended effect of the state's involvement in the provision of physical infrastructures was the creation of new built environment assets which manufacturing firms would treat as economies of agglomeration. Expansion of the harbour was a necessary prerequisite for the establishment of firms that were reliant on either the supply of raw materials or markets at a distance. The several rounds of investment in port facilities by the anglophones who controlled the Harbour Commission were directed to the western, mainly English speaking, part of the city. The construction of the new piers where the waterfront met the Lachine canal and the waves of investment in the Lachine canal (1843-1848 and 1873-1884) were critical factors attracting firms to that part of the city.⁵⁶ The growing demand for water by private households, commercial establishments and manufacturers; the risks and costs associated with the danger of fire; and the inability of private companies to provide a workable and comprehensive water system insured that municipalization and extension of the water system would become a paramount concern of the business elite. The commercial and industrial bourgeoisie who were involved with the Harbour Commission and the water system were part of a small but tight local alliance who

⁵⁶ R. Passfield, "Waterways" in Ball (ed.), *Building Canada*, pp. 119, 128.

were responsible for pushing for the extension and up-dating of the city's physical infrastructure.

Housing and land development

At the same time as local alliances with the support of the state were forging new and redeveloping existing infrastructures, a growing population was placing a strain on Montreal's housing stock. Expansion of the population - it more than doubled in the thirty years from 57,000 in 1851 to 140,000 in 1881 - implied a tremendous growth in the built volume and the land devoted to housing. While the land and housing development processes as such are not our subject here, it is essential to recognize their importance as they were critical features of the making of manufacturing spaces.

In the first place, there was the challenge of housing a fast-growing, wage-labour force. In nineteenth-century Montreal, housing supply lagged behind population growth. As early as the 1850s, a severe shortage resulted from the effects of industrialization, rapid immigration and devastating fires. As in most other cities, investment in housing tended to lag behind other sectors because housing was seen as risky, the turnover of capital was slow, and most house-builders could not compete in money markets with commercial and industrial investors. In response to the increasing demand Montreal's housing industry implemented two important changes. These were the penetration of capitalist features into the construction (new mass-production techniques and a new division of labour) and financial sides (institutional

and corporate investments) of the business; and the development of a new form of buildings - by the building cycle of 1866 to 1880 the multi-family dwelling had replaced the single-family dwelling as the most common type.⁵⁷

With the expanding physical size of the city the problem of the journey to work became pronounced. Many workers' families were caught in the pincers of the need for access to the jobs opportunities in the core and the dismal housing conditions of the inner city. As more and more workers were integrated into wage-labour, as families became dependent upon more than one income and as hours of work were long, workers' households were forced to minimize their journeys to work. Many writers have pointed out that the response to this situation was for working-class families to live in the belt of cheap housing surrounding the city core.⁵⁸ The desirability of a central location was reinforced by the lack of a suitable mass transportation network; the horse streetcar was unable to provide cheap and efficient transit, thus contributing to a tightly packed central city populated by the working and middle classes. In Montreal, broad swathes of housing throughout the inner city were taken over by working-class families. Another response to the challenge of the lengthening journey to work, inexpensive but crowded central housing, low wages, and general job insecurity was for workers to look for cheap housing on the

⁵⁷ D.B. Hanna, "Montreal, a city built by small builders, 1867-1880" (Ph.D. thesis, McGill University, 1986), pp. 13-14, 77-85; P-A. Linteau, R. Durocher and J-C. Robert, Quebec: a History, 1867-1929 (Toronto: Lorimer, 1985), p. 158.

⁵⁸ A. Pred, "The intrametropolitan location of American manufacturing", Annals of the Association of American Geographers, 1964, 54, pp. 165-180; D. Ward, Cities and Immigrants (New York: Oxford University Press, 1971), chap. 4.

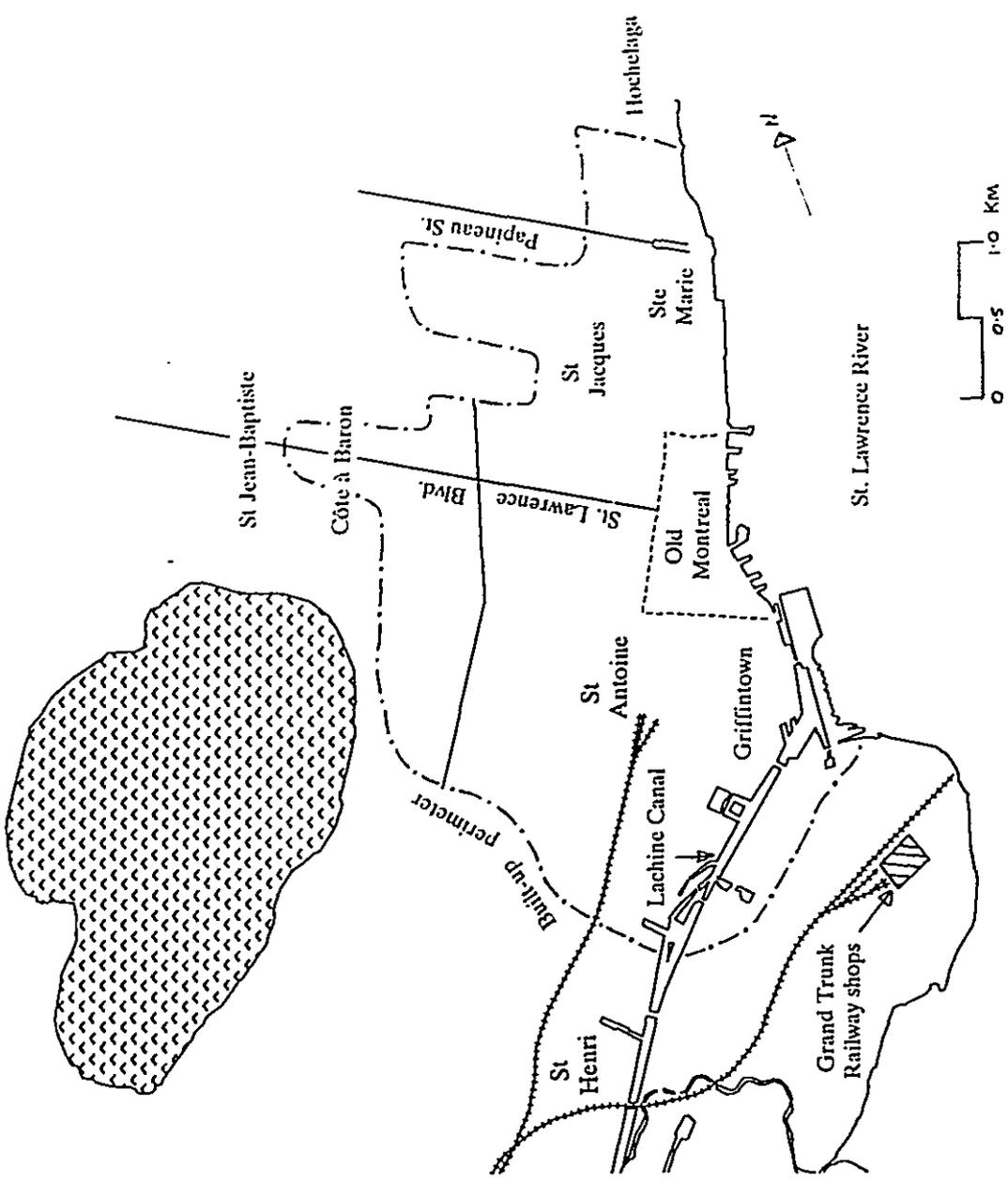
periphery close to where new manufacturing firms were being established. As early as 1861, a large number of workers were living in the fringes of the city in wards such as Saint-Ann, Sainte-Marie and Saint-Jacques.⁵⁹

The population and physical growth of the city were translated into a segregated and fragmented urban space as new class formations appeared, the ethnic balance changed, and the housing market took on new forms (Figure 5.4). By 1861, the city's social geography was characterized by class and ethnic segregation. By the 1850s, the wealthy anglophones had moved to the mansions and single-family dwellings of the newly created bourgeois district of upper Saint-Antoine that encircled the southern slopes of Mont-Royal, while the rich French-Canadians lived in little pockets extending north from Viger Square north along Saint-Denis and Berri streets. Although the inner city became increasingly working class as the bourgeoisie moved out to the city periphery, large numbers of the working class were living in the newly constructed duplexes on the western and eastern fringes of the city close to new concentrations of manufacturing. Although most job opportunities for women and children remained in the light, consumer goods industries located in the city core⁶⁰, work could be found, for example, in the rubber and tobacco factories that were being established in the East End after 1850. Clustered within these broad working-class residential patterns were groupings by

⁵⁹ Hanna, "Montreal, a city built by small builders"; R.D. Lewis, "The segregated city: class residential patterns and the development of industrial districts in Montreal, 1861 and 1901", Journal of Urban History, 1991, 17, 2, pp. 123-152.

⁶⁰ Cross, "The neglected majority", pp. 265-268.

FIGURE 5.4
MONTREAL, 1861



ethnicity: the Irish were concentrated in the western districts of Griffintown and Goose Village; the east end was largely French-Canadian; and the British working-class tended to reside in the industrial districts in the west. Sandwiched between these two polarized class districts was a 'buffer' district which contained all segments of Montreal's population.⁶¹

The rapid growth of Montreal after mid century created opportunities for developers and builders involved in the construction of infrastructures and housing. An expanding population meant a jump in land values, and a speculator, through correct timing, could cream handsome profits as the increase in land prices and demand burst across the urban terrain. By taking advantage of the opportunities open to them, land speculators were able to focus their activities to produce the greatest differentials, and so pocket the greatest profit. The building of the middle-class district of Côte à Baron after 1860; the opening up of the northern working-class suburb of Saint-Jean-Baptiste in the 1870s by the real estate company of David, Rivard, Laurent and Drolet; and the growing involvement of large-scale real estate companies in the financing and construction of housing throughout the city are all evidence of the speculators' ability to take advantage of industrial and urban growth.⁶²

⁶¹ D. Hanna, "The new town of Montreal: creation of an upper middle class suburb on the slope of Mount Royal in the mid-nineteenth century" (M.A. thesis, University of Toronto, 1977) and "Montreal, a city built by small builders", pp. 11-122; Lewis, "The segregated city"; P. Thornton, S. Olson and Q. Thuy Thach, "Dimensions sociales de la mortalité infantile à Montréal, au milieu du XIXe siècle", Annales de démographie Historique 1988 (Paris: Société de Démographie Historique, 1989), pp. 311-312.

⁶² R.S. Marshall, "The development of "La Côte à Baron"" (Paper written for the School of Urban Planning, McGill University, August 31st, 1983); J-C. Robert, "Ferdinand David" in Dictionary of Canadian

All of these factors generated a rather special characteristic: great profits could be achieved by coupling several circuits of capital (land, housing and industrial space), and creating 'spatial packages' or bundles of locational assets. The development of manufacturing districts - both in the core and elsewhere in the city - depended upon the creation of a viable built environment. There was, for example, opportunity to create workshops, factories, and housing for workers close together and at the same moment, likewise a 'main street' for their spending such as in the industrial district of Saint-Ann. The stringing together of different groups of capital in the east-end resulted in the emergence of an important working-class industrial district that ran along the business street of Notre Dame in Sainte-Marie ward and the suburb of Hochelaga. There was profit to be made in jointly creating expensive housing and a fancy shopping street such as Sainte-Catherine street in Saint-Antoine ward. Elsewhere, the city's elite from all segments of the economy was involved in redeveloping docks, warehouses and railway facilities.

5.4 Old Montreal and the Outer Core: Agglomeration and Productive Strategies

One feature of the burst of industrial growth after mid-century was the restructuring of Montreal's industrial geography. The purpose of the rest of this chapter is to examine in some detail the evolving spatial division of manufacturing within the context of three broad areas: 1) Old Montreal and the Outer Core; 2) the

Biography (Toronto: University of Toronto Press, 1982), vol. 11, pp. 235-236; M. Caya, "Sévère Rivard" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1982), vol. 11, pp. 755-756; Hanna, "Montreal, a city built by small builders".

East End; and 3) the West End. With the growth of new forms of industry and the reorganization of old ones, the city's geography became more complex. As I shall show, these three areas differed from each other in terms of their scale, and type of industry, the combination of productive strategies, and the timing of development. In this section I examine the central manufacturing complex composed of Old Montreal and the Outer Core and show how the dynamics associated with a diverse range of productive strategies were important in creating the distinct industrial geography of and a powerful set of agglomeration economies underlying these districts.

In 1848, on the eve of the great surge of industrialization, 'Old Montreal', the original walled core of the city, contained half of the city's business enterprises and two-thirds of total business rents.⁶³ While the banks, warehouses, and the offices of merchants, newspapers, shipping companies, lawyers and notaries were located in Old Montreal, the district was also an important manufacturing node. We cannot readily identify which nor how many of the district's business establishments were manufacturing, but I estimate fewer than 200. Most of them must have been small handicraft or family firms producing goods for the local market or merchant-manufacturers who imported, for their retailing or wholesaling activities, as many, if not more, goods as they manufactured. The modest character of the firms in Old

⁶³ The business data for 1848 refers to all forms of economic activity - manufacturing, financial, retail, commercial and construction. The data comes from a report presented to Fonds F.C.A.R. Québec entitled "Partage social et partage de l'espace à Montréal, 1847 à 1901" by D. Hanna (Geography Department, McGill University, 30th June, 1986). Throughout this study Old Montreal is made up of the two cells 75E and 76E, is bounded by the St-Lawrence river, McGill, Lagauchetière and Visitation streets, and consists mainly of the city's East, Centre and West wards.

Montreal is evident in the fact that 564 of the 787 establishments (seventy-one per cent) combined a place of work and place of residence.

Over the next few decades, Old Montreal would experience great changes, notably, for our purposes, the growth and consolidation of small and medium-scale manufacturing firms. While Old Montreal remained an important industrial space, despite the development of new ones in this period, it was characterized by a specific array of productive strategies. In order to assess the manner in which the productive space of Old Montreal developed I shall outline two important facets of its growth: the existence of small and medium-scale firms from a large number of industries which had special links to the economic context of the district; and the special opportunities and restrictions of its built environment. These two facets largely account for the distinct industrial profile of the central core in this period.

As Table 5.3 indicates, the 270 manufacturing firms in Old Montreal in 1861 accounted for more than forty-two per cent of the city's firms and thirty-seven per cent of total manufacturing rent. While its median rent was above the city average (\$120 compared to \$100) the mean rent was lower (\$202 compared to \$235): the central core had more than its share of small and medium firms.⁶⁴

Agglomeration economies, production formats and locational assets

Two important features of industrialization in this period were the breaking-

⁶⁴ As most of the firms that combined retailing or importing with manufacturing were located in Old Montreal, the district's share of manufacturing is probably overstated.

TABLE 5.3
MONTREAL MANUFACTURING FIRMS BY DISTRICT, 1861

DISTRICTS	FIRMS		RENT		RENT PER FIRM	
	#	%	Aggregate	%	mean	median
Old Montreal	270	42.8	54,472	36.7	202	120
Outer Core	227	36.0	36,068	24.3	159	60
St-Antoine	144	22.8	29,006	19.5	201	100
St-Lawrence	55	8.7	5,558	3.7	101	48
St-Jacques	28	4.4	1,504	1.0	54	38
West End	94	14.9	49,694	33.5	529	200
Lachine	40	6.3	38,532	26.0	963	550
Griffintown	53	8.4	11,062	7.5	209	120
St-Henri	1	0.2	100	0.1	100	100
East End	40	6.3	8,248	5.6	206	44
Ste-Marie	40	6.3	8,248	5.6	206	44
City	631	100.0	148,482	100.1	235	100

Source: City of Montreal, Rôle d'évaluation, 1861.

up of the chain of production into different productive units, and the creation of new industries and new branches. As firms became more specialized, they became increasingly reliant upon external economies through which they could lessen their costs. Instead of internalizing within the firm all functions necessary for the completion of a commodity, many firms externalized production. The emergence of external economies was associated with an expanding division of labour between production units and within individual factories. As I noted in earlier chapters the rise of external economies grew out of a number of problems associated with standardization and specialization of production. In several Montreal industries - clothing, printing, shoemaking and carriage making - the inability to standardize production because of market instabilities such as the vagaries of fashion or seasonal changes; the need for certain tasks to be performed under conditions of specialized knowledge or skill; and problems of matching different parts of the production process within the same plant in an optimal manner forced manufacturers to externalize parts of production to other firms.⁶⁵ As the division of labour intensified and more and more specialized firms came into existence, the vertical and horizontal linkages between them intensified accordingly. In the nineteenth century, for example, the small clothing contract shop performed a number of tasks that were uneconomical for the larger manufacturing wholesaler to undertake in the inside

⁶⁵ N.A. Phelps, "External economies, agglomeration and flexible accumulation", Transactions. Institute of British Geographers, N.S., 1992, 17, pp. 35-46; A.J. Scott, "Production system dynamics and metropolitan development", Urban Studies, 1982, 19, pp. 111-142; M. Storper and R. Walker, The Capitalist Imperative: Territory, Technology and Industrial Growth (New York: Basil Blackwell, 1989), pp. 79-83.

shop⁶⁶, and lawyers and printers provided legal and printing services for manufacturers and government.

The proliferation of external economies and the associated growth of vertical and horizontal linkages between firms and industries were critical to the continuing importance of Old Montreal as an industrial district after 1850. The development of external economies does not by itself, however, lead to the concentration of economic activity within the same area.⁶⁷ In Old Montreal a specific bundle of locational assets that preceded the full-scale industrialization after 1850 partly accounts for the clustering of a wide range of manufacturing firms into a tight economic complex. These firms generated and took advantage of a particular set of agglomeration economies unique to the district. Old Montreal was the centre of most of the city economic functions. It was core of the import/export business, with most of the city's merchants, importers, brokers and accountants having their businesses along the main arteries such as Saint-Paul, Notre Dame and Saint-Jacques streets. It was also the centre of the city's, and Canada's, financial system: along the small stretch of Great Saint James street between Place d'Armes and Saint François Xavier street were located the main offices of the City Bank, the Bank of Montreal, the Banque du Peuple, the City and District Savings Bank, and the Montreal Savings

⁶⁶ Payette-Dnoust, "The Montreal garment industry", pp. 105-11. Similar events were occurring in other North American cities. See S. Fraser, "Combined and uneven development in the men's clothing industry", *Business History Review*, 1983, 57, 4, pp. 522-547; E.K. Muller and P.A. Groves, "The changing location of the clothing industry: a link to the social geography of Baltimore in the nineteenth century", *Maryland Historical Magazine*, 1976, 71, 3, pp. 403-420.

⁶⁷ Phelps, "External economies", p. 37.

Bank. Old Montreal was also the nexus of the city's communications network: the Montreal Telegraph and the Vermont and Boston Telegraph companies, for example had their offices in Old Montreal; as did the Board of Trade, the Board of Arts and Manufactures, numerous shipping and freight companies and agents, and the prestigious bourgeois clubs. Old Montreal was surrounded by extensive transportation facilities that connected it to the world market: on its southern edge it was bounded by one of the most extensive harbour facilities in North America, while on its western perimeter was the Grand Trunk Railway's terminal. Public services were the best in the old city: water supply, docks, street paving and fire protection. A great variety of buildings provided flexible spaces for firms of all sizes. It had the best access to the labour force of the entire city. In short, the fact that Old Montreal was the original core of the city meant that it had historically been the focus of most of the business and ancillary functions, and presented to manufacturers a set of locational assets that could not be rivalled. Intensive rounds of construction took place in this period, piling new floors upon existing structures and creating entirely new buildings. The result was the expansion of the floor space available to manufacturers, merchants and retailers. By introducing new machines, a more intensive division of labour and new ways of organizing production and distribution, manufacturers were able to achieve increased output, greater productivity, the employment of more workers, and reach much wider markets.

Illustrative of the medium-sized, proprietary firm that took advantage of the agglomeration economies of the core is the furniture business of Owen McGarvey.

Five years after his arrival from Ireland in 1838, McGarvey opened a paint, oil and glass store and by the 1850s he had established himself as a furniture manufacturer. The chairs were machine-made at L'Assomption (a village forty kilometres from Montreal), hand-finished at his Montreal factory which was attached to his retail store where the chairs were sold. McGarvey's strategy was to manufacture a variety of styles from the plainest to the most expensive and fashionable, and to sell in large quantities directly to local customers who were attracted by the expensive and fancy decor of the store.⁶⁸

Garvey exemplifies the manufacturers who utilized the particular types of spaces available in Old Montreal. An immigrant, he worked and saved and was able to establish a small retailing store which sold unfinished, imported chairs in the local market. To bypass the difficulties associated with importing, he established a manufacturing concern that supplied his retailing store. He could produce common and medium class furniture (at L'Assomption), and fancy and custom-made lines (at Montreal), while directly taking advantage of the district's centrality, networks of fashion information, and the full range of craft skills. Throughout the second half of the nineteenth century, the combination of manufacturing and retailing was an important strategy that when allied with other productive strategies enabled a

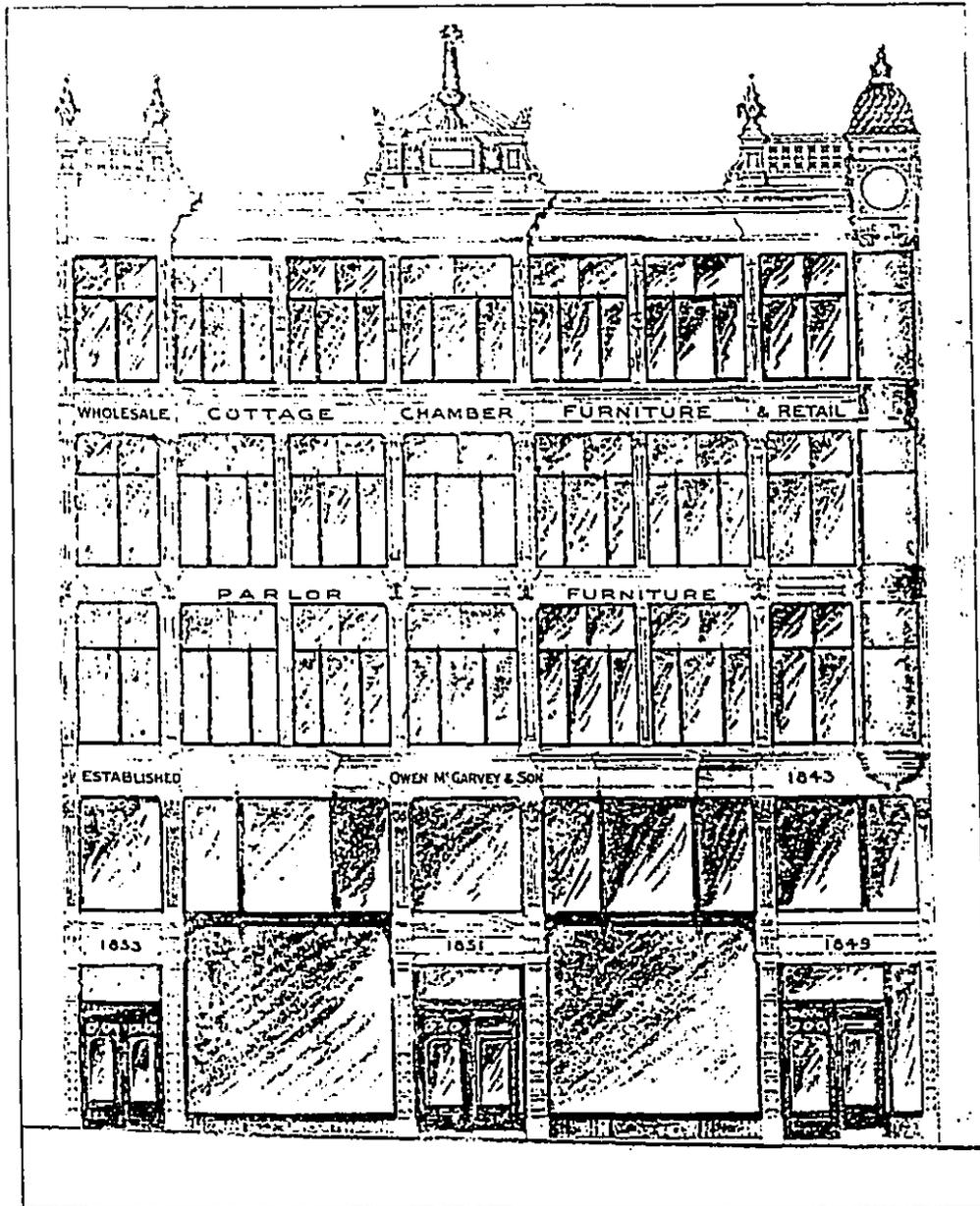
⁶⁸ E. Collard, "Owen McGarvey" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1990), vol. 12, pp. 624-625. Canada, Report of the Royal Commission on the Relations of Capital and Labour. Evidence - Quebec (Ottawa: Queen's Printer, 1889), vol. 3, pp. 726-727. The case of McGarvey well illustrates one of the methodological problems associated with using the tax rolls. I did not collect McGarvey from the 1861 rolls because he was not listed as a manufacturer even though his factory was attached to the store. He probably was enumerated as a merchant or furniture retailer, and therefore, not eligible for insertion in my data.

number of manufacturers located in Old Montreal to take advantage of the growing local market. So important was the type of space created in Old Montreal for this mix of manufacturing and retailing that McGarvey, in the 1880s, when his business had outgrown its premises, relocated to a six-storey building still at the very centre of the city core at the corner of McGill and Notre Dame streets (Figure 5.5).

While McGarvey's furniture business is an example of an individual firm taking advantage of the locational assets of the core, Old Montreal's development was built upon the consolidation and concentration of several industries that were highly dependent upon and were able to exploit the opportunities available there. While Old Montreal contained manufacturing firms from all industrial sectors functioning in Montreal, it had particularly large shares of clothing, printing, leather and jewellery firms (Figure 5.6). Associated with the range of industries in Old Montreal was a diversity of ways of organizing production. While we have few available descriptions of manufacturing firms, we can ascertain some idea of this diversity through a breakdown of the rent structure of the district. In Table 5.4 I divide the establishments in the important industries of Old Montreal and the surrounding districts into two categories of rent, small ($\leq \$40$) and large ($\geq \350). In conjunction with what we already know about the structure of these industries and the available firm descriptions, we can glean some clues as to the type of production strategies that firms were undertaking.

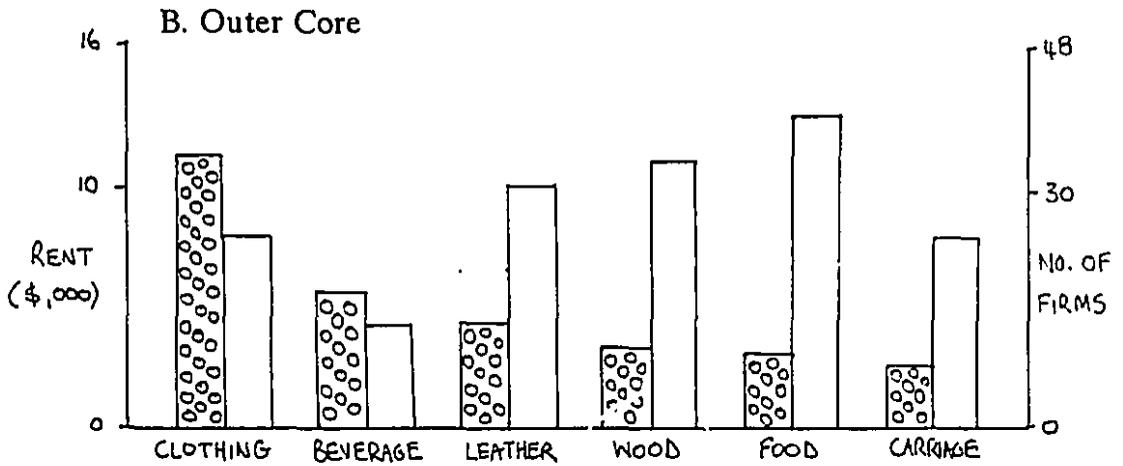
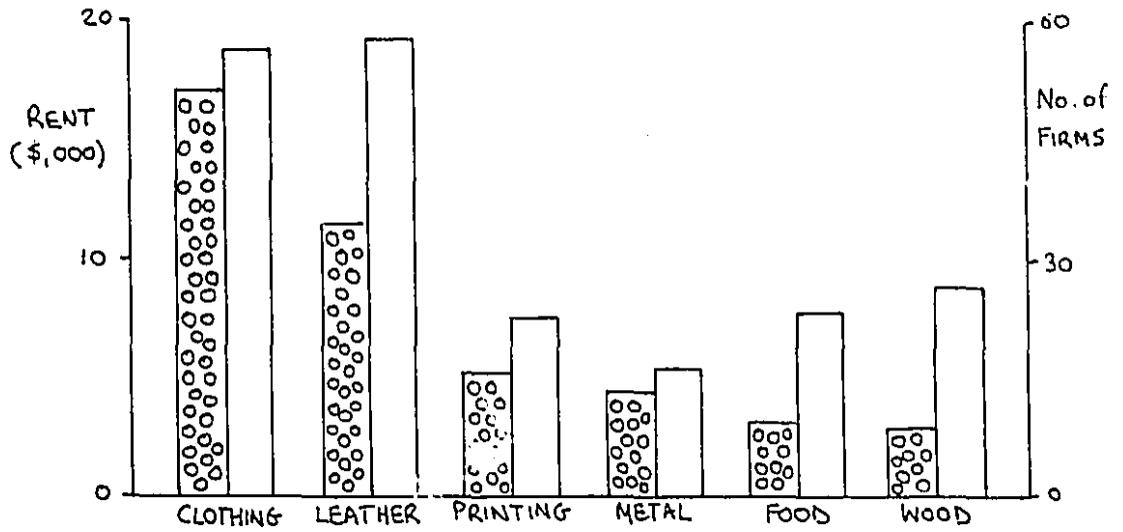
One of the formats common in Old Montreal was that employed by the artisan who performed handicraft techniques with one or two workers in a small

FIGURE 5.5
OWEN MCGARVEY STORE AND FACTORY, 1891



Source: The Dominion Illustrated, 1891

FIGURE 5.6
LEADING SECTORS IN OLD MONTREAL AND THE OUTER CORE
BY TOTAL RENT AND NUMBER OF FIRMS, 1861



 Total Rent
  Number of Firms

Source: City of Montreal, Rôle d'évaluation, 1861.

TABLE 5.4
RENT CHARACTERISTICS OF SELECTED INDUSTRIES IN
OLD MONTREAL AND THE OUTER CORE, 1861

	SHOE MAKERS	PRINT- ERS	JEWEL- LERS	CLOTH- ING	FUR & HAT	CARRIAGE MAKERS	BAKING	FURNI- TURE
Old Montreal								
1.	8 912	5 140	1 258	8 478	8 742	850	3 218	2 588
2.	43	12	12	27	29	6	23	17
3.	7	6		10	8		3	3
4.	4		3	1	4	2	11	
Saint-Antoine								
1.	2 982		380	8 336	2 000	980	1 604	2 224
2.	17		3	20	4	13	20	15
3.				12	2			2
4.	5			1		3	6	4
Saint-Lawrence								
1.	120	20				440	932	912
2.	2	1				6	13	6
3.								1
4.	1	1				3	4	3
Saint-Jacques								
1.	36		24			134	212	32
2.	1		1			4	4	1
3.								
4.	1		1			3	2	1

Note. Large and small are defined as more than \$350 and less than \$40 respectively. These categories correspond to the upper and lower quartiles of the rent distribution in 1861.

- 1. = Total rent (\$)
- 2. = Number of firms
- 3. = Number of large firms
- 4. = Number of small firms

Source: City of Montreal, Rôle d'évaluation, 1861

workshop tucked away in a less busy side streets. In the wood industry, for example, coopers, wood turners and carvers plied their trade in small workshops with rents ranging from \$30 to \$100. Another strategy was undertaken by merchants or artisans who combined manufacturing and retailing at the same location: usually manufacturing was performed in the back of their retail premises or upstairs. This group included confectioners, clothing manufacturers, custom shoe-makers, printers, gunsmiths, and jewellers, operating at various scales. For example, on the first two floors of Cassils and Cameron's hoopskirt manufactory were located the salesrooms for the crinoline dresses that they made on the upper two floors.⁶⁹ In the third form, prevalent in the clothing industry, merchant manufacturers gave outwork to households elsewhere in the city and surrounding rural areas, but kept within the premises some of the more critical steps of the production process such as cutting and designing. The wholesale clothing firm of McFarlane and Baird, for example, employed 1,000 workers in conditions where "a very large amount of work is accomplished by outside help", and where eleven cutters, some male tailors working by hand, and thirty women working on sewing machines worked 'inhouse'.⁷⁰ Finally, relatively large factories utilizing machinery and a detailed division of labour comprised the last format and included firms in the printing, shoemaking, clothing and metal-working industries. Take for example, John Henderson's fur factory on Notre Dame street, one of the largest firms in 1861 with a rent of \$1,100, where fifty

⁶⁹ Commercial Sketch of Montreal and Its Superiority as a Wholesale Market (Montreal: Chisholm and Dodd, 1868), p. 18.

⁷⁰ Commercial Sketch, p. 23.

hands made fur hats for both the Canadian and export markets⁷¹ or the foundry of Charles Garth where "numerous engines, boilers, etc" produced plumbing goods for the local market.⁷² At the wholesale manufacturers' factory of Findlay and McWilliams "the spirit of goaheadativeness has turned its attention" to the manufacture of candies and confections, "and the consequent effect is the introduction of machinery that simplifies, and with twenty-five rapidity, accomplishes the work." In their four-storey factory they had a highly detailed division of labour both in terms of the physical layout of the plant and the gender structure of tasks.⁷³

As the last format indicates while Old Montreal was dominated by small and medium firms that serviced local markets and pursued traditional productive strategies, Old Montreal did have a number of firms which employed new productive strategies that required extensive space, new layouts, and access to new sources of motive power. Indeed, one of the most important changes occurring to the built environment of Old Montreal after mid-century was the creation of a modern environment in which a wider range of firms could flourish. This did not mean that large-scale, highly-capitalized forms of manufacturing - such as Redpath Sugar and the Grand Trunk shops - were a substantive component of the core's structure, but the growing division of labour, the installation of machinery, and the development

⁷¹ Commercial Sketch, pp. 18-19. The high rent and relatively small number of workers employed at Henderson's fur works is unusual, apparently distorted by the retailing function that was attached to the manufacturing plant.

⁷² Celebration Committee, Montreal in 1856, p. 45.

⁷³ Commercial Sketch, pp. 37-39. The quote is from p. 37.

of large premises were part of Old Montreal's productive space.⁷⁴ Large-scale boot and shoe manufacturers, trunk makers, clothiers and hatters operated a highly divided work process and utilised machinery in three or four-storey buildings, especially in the western part of the district. A classic example of a centralized industry was leather-making, especially shoemaking which was characterized by a highly developed division of labour, simple mechanical systems, rapidly changing and unstandardized products, and fluctuating markets.⁷⁵ Like most other industries of the day there was a great difference in the scale of shoe firms. In 1871 a small number employed a substantial number of the city shoe workers and produced the vast amount of the city shoe production.⁷⁶ Nonetheless, large shoe manufacturers like Ames, Millard and Co. which in 1864 was located in a four-storey building "divided into numerous workshops, all of which are supplied with modern [steam-powered] machinery of the most approved patterns" coexisted side by side with smaller manufacturers and custom shoe makers.⁷⁷ Most of the larger firms were located in Old Montreal and the adjoining Saint-Antoine district (Figure 5.7). The

⁷⁴ As we shall see in the following sections of this chapter, other industrial districts were developed to accommodate the large firm.

⁷⁵ For a discussion of the Montreal shoe industry see J. Burgess, "Work, family and community: Montreal's leather craftsmen, 1790-1831" (Ph.D. thesis, Université du Québec à Montréal, 1986), 2 vols. and "L'industrie de la chaussure"; J. Ferland, "Evolution des rapports sociaux dans l'industrie canadienne du cuir au tournant du 20e siècle" (Ph.D. thesis, McGill University, 1985).

⁷⁶ In 1871 five firms - Charles Falardeau, George James and Co., Ames, Millard and Co., Smith, Cochrane and Co., and G.L. Rolland - each employed more than 350 workers while four employed more than \$200,000 in capital. See E. Martel, "L'industrie à Montréal en 1871" (Maitrise es Arts, Université de Québec à Montréal, 1976), pp. 46-47.

⁷⁷ "Manufacturing industry of Montreal", Gazette, July 27, 1864.

result was that the core was the home of

nearly 200 different kinds of boots and shoes. ... 500 sewing machines, 75 pegging machines, 30 sole-sewers, 30 sole-cutters, - besides large numbers of dieing machines, heeling machines - also machines for eyeletting, punching, skiving, rolling, &.⁷⁸

Alongside the shoe makers were a wide assortment of other leather manufacturers: leather hat manufacturers like McDowell and Atkinson had sunk \$16,000 into their plant and were employing 100 workers, seventy-five of whom were women.⁷⁹

Another centralized industry was that of printing, its central location depended upon it providing products and services to other businesses, rather than to final-demand consumers (Figure 5.7). Printers were able to take advantage of the nearness to business clients, face-to-face contacts and swift messenger services for orders, proofs, and deliveries. Printing in this period was extremely diverse: both within the two major branches - printing and publishing - and between them. As one writer has commented, in printing "[i]l existe semble-t-il dans cette activité des entreprises artisanales, des manufactures, mais aussi des entreprises dont l'organisation relève à la fois de la manufacture et de la fabrique".⁸⁰ In contrast, the publishing side of the industry was undertaken in larger and more mechanized premises.⁸¹ Printers in this period were extremely flexible manufacturers: many developed a combination of capacities for performing large and small jobs. An

⁷⁸ Patterson, Statements ... 1873, p. 40.

⁷⁹ Celebration Committee, Montreal in 1856, p. 46.

⁸⁰ Martel, "L'industrie à Montréal", p. 79.

⁸¹ Martel, "L'industrie à Montréal", pp. 78-80.

excellent example is that of John Lovell. Apprenticed to a Montreal printer in 1823, he gained a great deal of experience by working in a number of printing establishments over the next thirteen years. With his own printing house after 1836 he established a large and diverse business. His success was due to the mechanization of his plant - his installation of a steam-powered printing press in 1847 caused great consternation among printers - and the organization of the firm - he spread his risks through a combination of job and commissioned printing while specializing in lines such as directories, gazetteers and school books; long-term contracts with various state bodies; and gaining access to the rights for foreign books.⁸² With 147 workers and capital of \$80,000, Lovell had the largest printing establishment in Montreal in 1871.⁸³ Most firms did not have the type of security and wide-spread access to a number of different printing markets that Lovell did, and were reliant on immediate access to the major printing users of the day - lawyers and notaries, merchants, transportation companies and government offices. Accordingly, the printing industry formed two specialized clusters in the central core: next to the major retailing and the main financial and legal streets of Notre Dame and St-James and, further east, on the streets close to the administrative and legal core of the city.

The clothing industry: productive strategies and central spaces

The industry which best illustrates the complexity of the Old Montreal

⁸² G.L. Parker, "John Lovell" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1990), vol. 12, pp. 569-574.

⁸³ Martel, "L'industrie à Montréal", pp. 78-79.

manufacturing district and the overlapping of different productive strategies is the clothing trade which as many writers have pointed out before is the classic centre-seeking industry.⁸⁴ As Hiebert has shown for the Toronto clothing industry in the first decades of the twentieth century the garment trade was an extremely innovative industry which superimposed technological change upon important distributional changes and an intensive and advanced division of labour. The Montreal garment industry after 1850 was no different. It was a highly innovative and advanced industry, and its central location was due to the way that clothing manufacturers took advantage of centrality and fused it with the changes that they implemented to technology and labour practices. The centralization of clothing production in the city core can be traced back to the early nineteenth century and even with the tremendous changes wrought to the industry over the course of the century there would be little change to its locational pattern. These changes started as early as the 1820s when, despite the small scale of firms and the reliance on traditional tools, clothing was reorganized through an increasing division of labour. Masters and mistresses began to separate themselves from production and take on a purely supervisory and coordinating role. Work also became increasingly divided into

⁸⁴ A number of studies of the clothing industry from the mid-nineteenth century up to the present day have shown the importance of a central location. P.G. Hall, "The location of the clothing trades in London, 1861-1951", Transactions. Institute of British Geographers, 1960, 28, pp. 155-178; D. Hiebert, "Discontinuity and the emergence of flexible production: garment production in Toronto, 1901-1931", Economic Geography, 1990, 3, pp. 229-253; E.M. Hoover and R. Vernon, Anatomy of a Metropolis, pp. 59-69; Muller and Groves, "The changing location of the clothing industry"; A.J. Scott, "Industrial organization and the logic of intra-metropolitan location, III: a case study of the women's dress industry in the Greater Los Angeles region", Economic Geography, 1984, 60, 1, pp. 3-27; G.P.F. Steed, "Location factors and dynamics of Montreal's large garment complex", Tijdschrift voor Economische en Sociale Geografie, 1976, 67, 3, pp. 151-168 and "Standardization, scale, incubation, and inertia: Montreal and Toronto clothing industries", Canadian Geographer, 1976, 20, 3, pp. 298-309.

different degrees of skill.⁸⁵ The intensification of the division of labour led to the employment of large numbers of women and children as employers attempted to reduce production costs through the lowering of wages.⁸⁶ In the years after 1850 the division of labour was intensified and the industry became mechanized. The main cost items of the clothing manufacturer were materials and wages. The most successful way to reduce costs was through labour, as the possibilities of reducing material costs were small and largely out of the clothing manufacturer's control. By the second half of the nineteenth century, most firms, both large and small, had developed a detailed division of labour further divided by skill and gender. The basic division of labour consisted of cutting, sample making, operating, basting, finishing, pressing, buttonholing and cleaning, each step being divided along lines of skill and gender.⁸⁷ Superimposed upon, and in some cases restructuring, the division of labour was the introduction of a series of technological innovations. The most important was the introduction of the sewing machine after mid century. While the sewing machine remained relatively unchanged over the course of the century it transformed the clothing industry as it allowed manufacturers to replace skilled workers with less skilled workers, and spurred the intensification of the division of

⁸⁵ M.A. Poutanen, "For the benefit of the master: the Montreal needle trades during the transition, 1820-1842" (M.A. thesis, McGill University, 1985).

⁸⁶ For a general discussion of the integration of women into Montreal's manufacturing sector see Cross, "The neglected majority".

⁸⁷ Payette-Daoust, "The Montreal garment industry", pp. 100-102.

labour.⁸⁸ The advantages of the machines as contemporaries saw them can be discerned from a description of the sewing machine department of McFarlane and Baird. "In one large room thirty sewing machines are in operation humming their lively rattle incessantly, weariness to their metal sinews is a thing unknown, their needle never lags, no romantic musings surround them".⁸⁹ The popularity of the sewing machine in Montreal, besides its obvious cost and labour advantages, was related to the availability of spare parts, convenient local machine servicing, and the massive advertising campaign implemented by the sewing-machine makers. Even the most difficult and skilled part of the production process was mechanized by the early 1870s when steam-powered cutting machines were introduced into the city's clothing factories.⁹⁰

The widespread application of an intense division of labour and the introduction of machinery in the clothing industry after 1850 did not mean that garment firms followed a similar trajectory of growth. In Montreal in the second half of the nineteenth century the clothing industry was characterized by at least three

⁸⁸ Fraser, "Combined and uneven development", p. 526.

⁸⁹ Commercial Sketch, p. 23. Another interesting aspect of this quotation are the advantages, implicitly stated, of the machines over the "weariness" and "romantic musings" of the workers.

⁹⁰ Payette-Daoust, "The Montreal garment industry", p. 90-99. From an early date Montreal had a sewing machine manufacturing company and in 1871 it had three which produced more than \$250,000 worth of machines. For a discussion of the development of the sewing machine industry see D. Hounshell, From the American System to Mass Production, 1800-1932: the Development of Manufacturing Technology in the United States (Baltimore: John Hopkin Press, 1984), chap. 2.

different productive formats.⁹¹ The first was the small shop which, after 1850, continued to dominate in terms of number of establishments. Some of the small establishments were custom shops catering to a local elite market, while others were making ready-made clothing for the working class. The small shop was greatly represented among men's tailoring (suits, overcoats, pants and jackets) and women's clothing: firms with less than fifteen workers accounted for 139 of the 179 firms in these two clothing branches in 1871.⁹²

Also in this period, a small number of firms performed 'inhouse' production which featured a large number of machines, a highly developed division of labour, and a sophisticated system of distribution: they were particularly to be found in the men's furnishing branch (shirt, collar, cuffs, and ties). Examples of this include John Aitken's shirt factory in 1856 which employed more than 300 women, S.B. Scott's shirt factory where 100 men and women used ten sewing machines in 1856, and Cassils and Cameron in 1868 employed more than 100 women in the making of hoopskirts in their four-storey building on Recollet street.⁹³

A third productive format was the organization of outwork by wholesale manufacturers. One writer has stated that in this period "true factory production was almost non-existent" as many Montreal manufacturers "had the bulk of their goods

⁹¹ Studies of the clothing industry in other mid-nineteenth-century cities, which highlight the wide range of production formats are Hall, "The location of the clothing trades" and Muller and Groves, "The changing location of the clothing industry".

⁹² Martel, "L'industrie à Montréal", p. 56; Payette-Daoust, "The Montreal garment industry".

⁹³ Celebration Committee, Montreal in 1856, p. 46; Commercial Sketch, pp. 18-19.

made up in the rural villages beyond the city".⁹⁴ According to another,

the garments were cut on the premises of the wholesale clothing house, tied into bundles with the linings and trimmings, and sent out into the country to be made up. Farmers for miles around the populous centers would drive in to the towns, carrying homes the bundles of cut garments and these would be put together at home, being brought back a week or so later when the payment would be made on the basis of so much per garment.⁹⁵

In 1874 H. Shorey testified that of the 700 workers he employed, most worked at home while he hired about seventy "inside who prepare work to go out." These inside workers tended to be cutters. At William Muir's plant, which had a similar ratio of inside and outside workers, the cutting was done by "a knife which cuts the cloth by steam, so that four cutters will do the work of from twelve to fifteen."⁹⁶ The division of labour here was very pronounced: men did the cutting in the factory while women and children performed the sewing tasks at home. Many of these firms employed a large workforce. In 1871 the six largest firms employed forty per cent of the city's clothing workers and forty-three percent of clothing production.⁹⁷ These firms continued to grow over the period: in 1883 Shorey was adding an additional storey

⁹⁴ Payette-Daoust, "The Montreal garment industry", p. 105.

⁹⁵ R.P. Sparks, "The garment and clothing industries", Manual of the Textile Industry of Canada, 1930 (Montreal: Canadian Textile Journal Publishing Co., nd.), p. 109.

⁹⁶ Canada, "Report of the Select Committee on the Manufacturing Interests of the Dominion" Journals of the House of Commons 1874 (Ottawa: I.B. Taylor, 1874), Appendix 3, pp. 23, 36. The putting-out system would last well into the end of the nineteenth century, although its importance declined in reverse proportion to that of the contract system which by the 1880s was becoming one of the major organizational forms in the clothing industries. See Payette-Daoust, "The Montreal garment industry", pp. 105-110; F.R. Scott and H.M. Cassidy, Labour Conditions in the Men's Clothing Industry (Toronto: Thomas Nelson and Sons Ltd, 1935), p. 2; Teal, "The organization of production", pp. 162-198.

⁹⁷ Martel, "L'industrie à Montréal", p. 57-58.

to his main building and had bought the building next door and he employed somewhere between 3,000 to 4,000, many of whom were "engaged in the many small factories of the firm in the neighbouring towns and villages, and even as far as the city of Quebec, where much of the work is done". As was pointed out the, this dual system - of skilled workers in the main building and putting-out to the countryside - combined "the advantages of cheap labour with the skill of first-class cutters and labor-saving machinery."⁹⁸

Despite the fact that the Montreal clothing industry featured a range of productive strategies, with very few exceptions in the thirty years after 1850, the industry was concentrated in Old Montreal, and to a lesser extent in the surrounding Outer Core (see Figure 5.7).⁹⁹ This is not surprising because, as other writers have pointed out for other cities, a principal reason behind the centrality of the clothing industry was the fact that it functioned under a vertically-disintegrated system of production.¹⁰⁰ The clothing industry was dependent upon a highly evolved system of external economies: there may have not been a great deal of physical flow of materials between clothing firms - at least in the period before the advent of the contract shop - but the information flows in terms of price signals, the latest design

⁹⁸ Canadian Journal of Commerce, March 30, 1883, pp. 1040-1041. I assume that by "small factories" the writer was referring to the homes of the women who did the sewing.

⁹⁹ As well as the 1861 figures which indicate the dominance of the central area - Old Montreal had two-thirds of the city's clothing establishments and total rent - Payette-Daoust states that most clothing firms in the second half of the nineteenth century were located in the city centre. See "The Montreal garment industry", p. 58. The exceptions were the small women's dressmaking shops.

¹⁰⁰ See Hall, "The location of the clothing trades" for a discussion of this in the nineteenth-century London garment industry.

and materials, proximity to retailing outlets, and access to a large and diverse labour force were critical factors for an industry dependent upon the reduction of labour costs, and the vagaries of seasonal fashion and price changes.¹⁰¹ As one writer put it, "fashion is a stern dictator and those who faithfully follow her many vagaries require a somewhat plethoric purse to stand the pressure".¹⁰² Both manufacturers and consumers were under constant "pressure" to keep up with the changing character of the industry. Manufacturers not only had to change their lines four times a year to keep up with seasonal changes, but they had to make constant adjustments to stay abreast of changing fashions. While firms like that of Cassils and Cameron had turned to the production of crinoline dresses which had "become a staple of trade" by the 1860s, many manufacturers had to switch their productive strategies because of the "consequent discardment of the weighty and multitudinous skirts" that had previously reigned supreme.¹⁰³ Moreover, externalization of production took place as entry into the industry was easy because capital investment per worker was very low; the barriers to knowledge about the industry were permeable; space requirements were easily filled; and machinery was small and easily

¹⁰¹ Hall, "The location of clothing trades", pp. 173-174; Steed, "Location factors and dynamics", pp. 153-155. For an excellent description of these agglomeration economies in a related industry see P. Scranton, "An exceedingly irregular business; structure and process in the Paterson silk industry, 1885-1910." in P. Scranton, (ed.), Silk City. Studies on the Paterson Silk Industry, 1860-1940 (Newark: New Jersey Historical Society, 1985), pp. 35-72.

¹⁰² Commercial Sketch, p. 18.

¹⁰³ Commercial Sketch, p. 18.

moved.¹⁰⁴ The intensification of external economies in the clothing industry continued to occur, despite the fact that "from 1850 mass sewing and mass cutting revolutionized the industry technically and economically", and meant that there would be "little change in the existing small-scale organization" of clothing firms.¹⁰⁵

The small-scale character of the clothing industry was a critical factor behind its clustering in the core of the city. While on the one hand, the bounded character of agglomeration economies - at least in terms of inputs - may have played little part in the location of the industry, on the other, the package of locational assets represented in the form of Old Montreal was a powerful force behind the industry's centralization. While we do not know how much of the raw material was obtained from the nascent Canadian textile industry, some of which was located in Montreal, or imported from the United States and Britain, none of the major textile manufacturers were located in the vicinity of Old Montreal. Of course while cloth continued to come through the harbour and remained in the hands of importers, a central location would have been an important consideration, especially as the type, cost, quality and amount of cloth available were important production considerations. Nonetheless, as Hall points out, materials - as well as fuel and power - were a small part of total production costs and probably had little impact upon manufacturers' locational decisions¹⁰⁶, and the fact of the pedestrian scale of the city and the

¹⁰⁴ Steed, "Location factors and dynamics", p. 152.

¹⁰⁵ Hall, "The location of the clothing trades", p. 166.

¹⁰⁶ "The location of the clothing trades", pp. 162-163.

labour-intensive character of the industry raise questions about the importance of proximity to raw material suppliers.

More important were the factors of the market, labour and production space. The importance of the market lies not in the cost of getting clothing to market but in the numerous linkages between producers and consumers. As one writer has stated, "because of the importance of individual fit and the capricious and unpredictable trends of style, close and frequent contact with the market is imperative."¹⁰⁷ Montreal's clothing market was comprised of several sub-sections. Custom-made clothing makers needed to be in close proximity to the city's elite and middle class, most of whom worked in or had easy access to the city core. The market for wholesale ready-made goods was not the final consumer, but the wholesale houses, all of which were located in Old Montreal. As the primary retailing centre in this period was along Old Montreal's major thoroughfares, the market for retail ready-made clothing was in the dry goods and clothing stores along streets such as Notre Dame.

The elasticity of the spatial boundary of the labour market - reaching out to the city's rural districts - would have acted to reduce the importance of the core as a location for firms, especially in light of the fact that labour constituted the largest single cost; thus it could have been equally "rational" to have set up shop close to the low-skilled labour source. Despite this, however, manufacturers remained in the core so as to be close to skilled workers (cutters and pressers) and because the costs of

¹⁰⁷ Hall, "The location of the clothing industry", p. 163.

transporting the material and the sewn goods to and from the rural households were either undertaken by the sewing families themselves or constituted only a fraction of a firm's total production costs.¹⁰⁸

Equally important was the range of flexible work spaces available in the core. Most clothing firms did not require large, complicated and extensive work areas: they needed little space to house machinery; the through-flow of materials was relatively unsophisticated; and stocks of raw materials and finished goods were, because of the nature of demand, kept at a minimum. The core contained a mixture of different work spaces from which different clothing manufacturers could choose from such as stores along Notre Dame and Saint-Paul streets for the custom shops and the merchant tailors, and three to four-storey warehouse structures for the larger inhouse and putting-out manufacturers. Lastly, adding to the ability of clothing firms to remain in the core was that as a great amount of production was put-out, firms were able to pass on the costs of overhead and machinery to workers, thus allowing the firms to bear the higher costs of a central location and the agglomeration economies that were centred there.

Adaptation and conversion of the built environment

Old Montreal was composed of structures inherited from the past; which had to be perennially adapted and re-adapted to the demands of the present. The city's

¹⁰⁸ Evidence that the farmers carried the costs of transportation is in the above quoted statement by Sparks, "The garment and clothing industries", p. 109.

mercantile history had frozen in place a series of buildings which under the forces of industrial capitalism became the warehouse-manufacturing district, an identifying feature of most North American cities in the second half of the nineteenth century¹⁰⁹, and the focus of a great variety of firms from a large array of industries. While vertical in construction, Montreal's warehouse district provided a series of advantages to the small to medium manufacturer of the mid century: a range of spaces from the small garret to the large multi-story building; a corresponding diversity of rents; and close proximity to other firms. Many firms combined retailing and manufacturing in the same location, and Old Montreal's primacy as city's retail centre enabled the merchant/manufacturer to capture the local market while overseeing the several tasks at a single location. Nonetheless, the development of the fixed built environment to meet the evolving needs of manufacturing, not to mention other economic functions, entailed a great deal of structural reconstruction that, for a number of reasons, was frequently difficult to meet. These include the physical durability of the buildings themselves; the high cost of making improvements; the desire of property owners to put immediate gains ahead of longer range or high-risk benefits; the existence of market imperfections; and technological barriers to redevelopment.¹¹⁰

Despite the difficulties associated with restructuring the space of Old Montreal, there was an on-going process of converting space from pre-industrial to

¹⁰⁹ Ward, Cities and Immigrants, chap. 3.

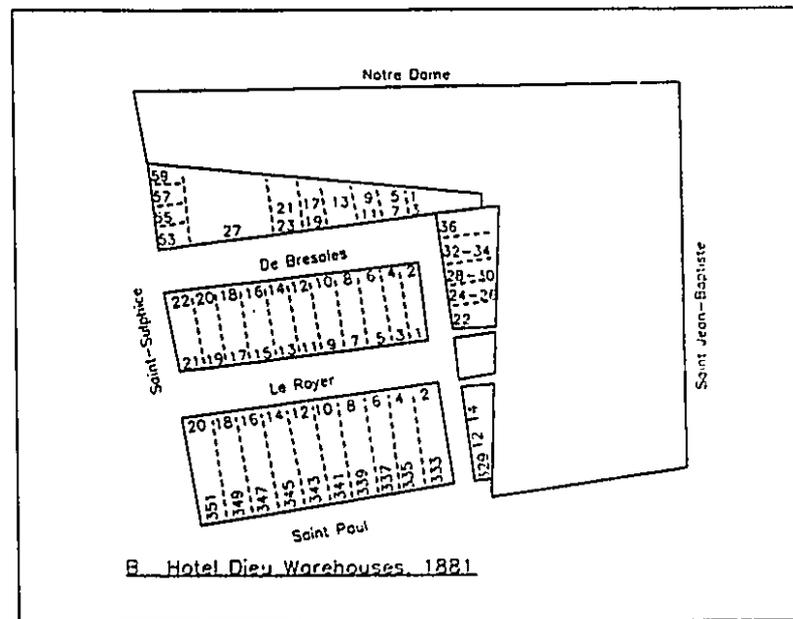
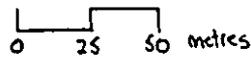
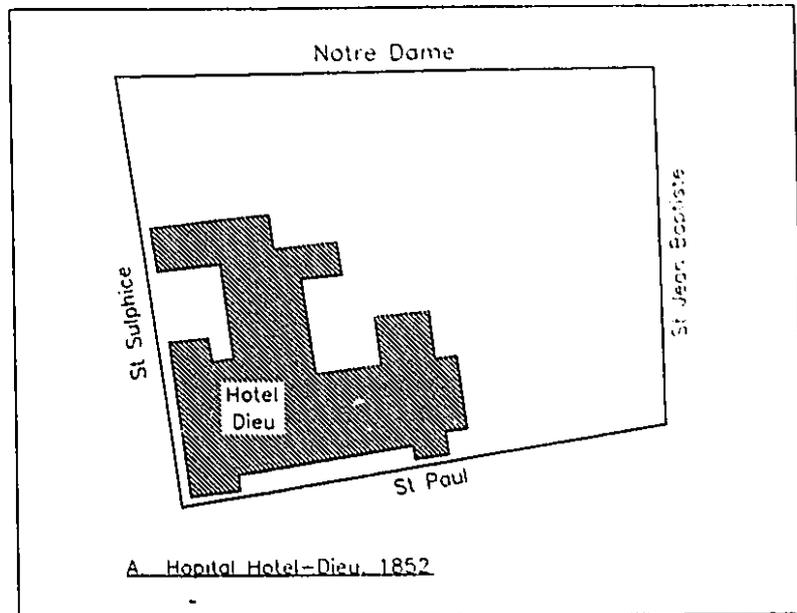
¹¹⁰ C.M. Rosen, The Limits of Power: Great Fires and the Process of City Growth in America (New York: Cambridge University Press, 1986), chap. 2.

industrial use. This included introducing new technologies and methods to buildings to raise them from the three to four-storeys in 1850 to nine to twelve-storeys by the 1880s; widening old and building new streets; and laying down of new infrastructures. To illustrate some of these processes the reconversion of the land of the Hôtel-Dieu and the Grey Nuns' hospitals will be briefly presented.

In 1860 the Hôtel-Dieu which had since 1644 occupied a large section of the block bounded by Saint-Sulpice, Notre Dame, Saint-Jean Baptiste and Saint-Paul streets in the city's Centre ward moved to the city's northern periphery at Pine and Sainte-Famille streets.¹¹¹ Immediately the land, which remained the property of the Hôtel-Dieu, was converted to commercial and manufacturing uses. This took place in two stages: the remodelling of the physical layout of the land - the building of De Bresoles, Le Royer and Saint-Dizier streets in the space vacated by the hospital; and the building of a series of five to seven-storey warehouses to accommodate a variety of economic activities. As Figure 5.8 and Table 5.5 indicate, by 1881 forty-one warehouses had been constructed and were occupied by a range of commercial (hardware, groceries, grain) and manufacturing (cigars, rubber, electro-plating, mirrors) interests. Covering an area of more than 100,000 square feet, in 1881 the buildings were valued at almost half a million dollars and generated, according to the

¹¹¹ Marsan, *Montréal en Évolution*, p. 72. It should be noted that the move of the Hotel Dieu to the northern fringe set off a process of land subdivision and middle-class housing construction after 1860. See Marshall, "The development of "La Côte à Baron".

FIGURE 5.8
CHANGES TO THE HOTEL DIEU LAND IN OLD MONTREAL,
1852-1881



Source: W. Mckenzie, Map of the City of Montreal Showing the Latest Improvements, 1852; Goad, Atlas of the City of Montreal, 1881; City of Montreal, Rôle d'évaluation, Centre ward, 1881; Lovell, City Directory, 1881.

TABLE 5.5
THE OCCUPANTS OF THE HOTEL DIEU WAREHOUSES, 1881

DE BRESOLES

2-4	B. & H. Thompson	O&S	English hardware
6	vacant		
8	Gibertson & Co.	O&S	Importer, European wines
10	J. Everleigh & Co.	factory	Trunks and leather bags
12	Rankin, Beattie	O&S	Agent, Canada Thread
14	D. Hogg	factory	Mirrors and mouldings
16	M. Dexter	factory	Unknown
16	Alberic DeLaet	office	Importer, grain
18	Simpson, Hall & Miller	factory	Electro-platers
20	Lamarche, Prevost	O&S	Importer, dry goods
22	T. Phillips	O&S	Merchant, hardware
1-3	J. Vermette	trader	-
5-7	A. Belanger	storage	-
9-11	vacant		
13-15	J.L. Cassidy	storage	Importer, china, glass, etc
17-19	Canada Paper Co.	storage	Paper goods
21-23	O'Brien, Kiernan	factory	Wholesale clothier
27	Benny, McPherson	yard	Merchant, hardware

SAINT-DIZIER

22	G. Fischel & Co.	factory	Cigars
24-26	Canada Rubber Co.	storage	Rubber goods
28-30	J.L. Cassidy	storage	China, glass, etc
32-34	B. & H. Thompson	storage	Hardware
32-34	Vipond, McBride	storage	Merchant, fruit
36	C.H. Godingly	storage	Unknown

SAINT-PAUL, NORTH SIDE BETWEEN SAINT-DIZIER AND SAINT-SULPHICE

329	C. Lacaille	O&S	Merchant, fruit
333	J.M. Fortier	factory	Cigars
335	Canadian Rubber Co.	O&S	Rubber goods
337	vacant		
339	J. & L. Cassidy	office	Merchant, china, glass, etc
343	J.A. McKedie	factory	Wholesale clothier
345	Alex Buntin & Co.	office	Stationary and paper goods
347	Hodgson, Summer	O&S	Wholesale dry goods
351	Kerry Watson	storage	Drugs

SAINT-SULPHICE, EAST SIDE AND NORTH OF DE BRESOLES

53	J. Watson	O&S	Agent, hardware & cutlery
55	H. Jonas & Co.	factory	Colourings and essences
57	H. Ascher	O&S	wholesale tobacconist
59	R. McKenzie	office	civil engineer

O&S = office and storage.

Source: City of Montreal, Rôle d'évaluation, 1881, Centre Ward. Lovell, Montreal City Directory, 1881.

role d'évaluation, more than \$21,000 in rent.¹¹²

A similar process was at work further to the south by the waterfront: in the early 1870s the Grey Nuns moved their convent and hospital to a new location at Dorchester and Guy streets. The Grey Nuns quickly commissioned the building of a number of warehouses, which along with the old hospital, were rented out to a number of commercial and manufacturing concerns.¹¹³ As is shown in Figure 5.9 and Table 5.6 the change was as dramatic as that which took place at the Hôtel-Dieu land. In the area bounded by McGill, Youville, Common, Port and Foundling streets - most of which was owned by the Grey Nuns - a variety of merchants and manufacturers moved into the many-storeyed warehouses that were built.¹¹⁴ In contrast to the Hôtel-Dieu land, and representative of the specialized sub-districts of Old Montreal, the major occupiers of the buildings were produce, provision and coal merchants, as well as other activities dependent on the waterfront for their livelihood. In 1881 the Grey Nuns owned almost 100,000 square feet of land with buildings valued at almost half a million dollars, which generated more than \$21,000 of yearly rent.

One dimension of the restructuring of industry at mid-century was the

¹¹² The data was gathered from W. McKenzie, Map of the city of Montreal Shewing the Latest Improvements, 1852 (Montreal: 1852); C.E. Goad, Atlas of the City of Montreal From Special Surveys and Official Plans Showing All Buildings and Names of Owners (Montreal: C.E. Goad, 1881-1890) and from Ville de Montréal, Rôle d'évaluation, 1881 for Centre Ward.

¹¹³ G. Goliger, "Le Cours St-Pierre", Habitat, 1982, 25, 4, p. 36.

¹¹⁴ McKenzie, Map of the City of Montreal; Goad, Atlas of the City of Montreal, 1879; Ville de Montreal, Rôle d'évaluation, 1881 for West ward.

TABLE 5.6
THE OCCUPANTS OF THE GREY NUN WAREHOUSES, 1881

Mercantile Activities

	No. of Firms	Rent (\$)
Produce and Commission Merchants	11	5,640
Coal Merchants	4	1,590
Merchants (Other)	11	4,070
Traders	3	420
Warehousing	2	1,600
Total	31	13,320

Manufacturing Activities

	No. of Firms	Rent (\$)
Boot and Shoe Factories	3	3,200
Factories (other)	6	4,420
Offices of Manufacturing Firms	3	2,700
Total	12	10,320
Grand Total	47	24,440

Note: Grand total includes three firms with rent of \$800 that could not be classified and one vacant office with no rent.

Source: City of Montreal, Rôle d'évaluation, 1881, West ward.

intensification of Old Montreal as a manufacturing district. We have seen growth in the number of firms and a consolidation of the existing attributes of the district. It became the primary location for industries with specific characteristics and needs. Small and medium-scale firms operating under handicraft and manufactory conditions predominated; although the district's array of transportation and communication facilities were important factors behind the existence of some larger firms in a variety of other industries. Nonetheless, the inherent contradictions of growth - the small area, increasing rents, inadequate buildings and competition from financial and commercial functions - made it impossible for all such firms to find places to establish their manufacturing operations. There were answers to these problems, most notably the construction of more spacious or higher buildings. Heights of buildings were severely limited.¹¹⁵ To meet the demand of firms and industries for central agglomeration economies, new industrial districts were developed, as we shall now see.

Growth of the Outer Core

While the problems leading to the overcrowding of Old Montreal limited the availability of manufacturing sites for a number of firms there arose by 1861 a secondary zone which offered many similar advantages. Encircling Old Montreal was, what I call, the Outer Core zone. It was made up of three separate districts - Saint-

¹¹⁵ These limitations included the inability of stone and wood to withstand the strain of vertical and horizontal extensions; the unavailability of cheap structural steel until after the introduction of the Bessemer process in the mid 1870s; and the slow development of engineering and architectural methods and technologies which could utilize existing changes. See Rosen, The Limits of Power, pp. 26-29.

Antoine, Saint-Lawrence and Saint-Jacques - which together accounted for a third of firms and a quarter of manufacturing rents.¹¹⁶ This was a tremendous increase from 1848; for example, at the early date, Saint-Antoine had only twenty-eight business establishments of all kinds for a rent of \$2,456 while in 1861 there were 144 manufacturing establishments worth more than \$29,000, all situated in the southern belt which later became Saint-Antoine South ward.¹¹⁷ The Outer Core specialized in the manufacture of food (mainly baking), beverage, clothing, leather, wood and carriage products (Figure 5.6). In 1861 most of the firms and the rent were clustered in the Saint-Antoine district, particularly the larger firms in leather and clothing, while the two smaller districts specialized in the small-scale handicraft shop in the food, beverage and wood trades. This zone was an extension of the central core in terms of the sectors represented, the size distribution of firms, and the concentration of particular productive formats. This was especially true of Saint-Antoine, whose manufacturing district extended along the main thoroughfares (Notre Dame and Saint-Antoine streets) leading from Old Montreal. The firms settling in these districts took advantage of agglomeration factors that made Old Montreal attractive to a host of inter-related firms - access to information and credit, supplier and buyer firms, a wide selection of labour skills, and an array of flexible spaces.

¹¹⁶ Although the development of these areas goes back to the period preceding the focus of this study, the aim of this section is to highlight some features of their post-1850 growth. For a discussion of the early development of Saint-Lawrence's artisanal growth see A.M. Stewart, "Settling an 18th-century faubourg: property and family in the Saint-Laurent suburb, 1735-1810" (M.A. thesis, McGill University, 1988).

¹¹⁷ It should be noted that the spatial boundaries of the various divisions of the city between 1848 and 1861 are not always the same. The 1848 districts are based on ward boundaries while the 1861 ones are made up from a grouping of cells superimposed upon the city.

One industry that found the Outer Core of exceptional importance was the manufacture of carriages. It illustrates the economic processes underlying the success of the district. Although there was a growing division of labour in carriage-making in this period, like the early stages of the transformation of the shoe industry, this did not involve mechanization. Carriage-making was still done by hand, and mechanization had to wait to the 1870s. As in the United States, "[i]n 1865 a woodworker used augers, chisels, and a maul to cut tenons by hand, ... the [dashboard] trimmer ... used needle and awl. In 1865 every step in buggy-making was done by hand".¹¹⁸ So advanced was the division of labour that even the small carriage shop had to have at least one blacksmith, painter, wood-worker, and trimmer if it was to be successful.¹¹⁹ Firms were still relatively small in scale and access to a central location was essential if firms were to compete with one another and gain the services necessary for successful production. In 1871 thirty-five carriage-making firms employed little over \$120,000 in capital, while twelve of them employed only two or three workers each. Only one firm - N. and A. Larivière's Canada Coach and Sleigh factory - used steam power. As Martel states, "l'industrie artisanale domine cette production qui semble destinée au marché local."¹²⁰

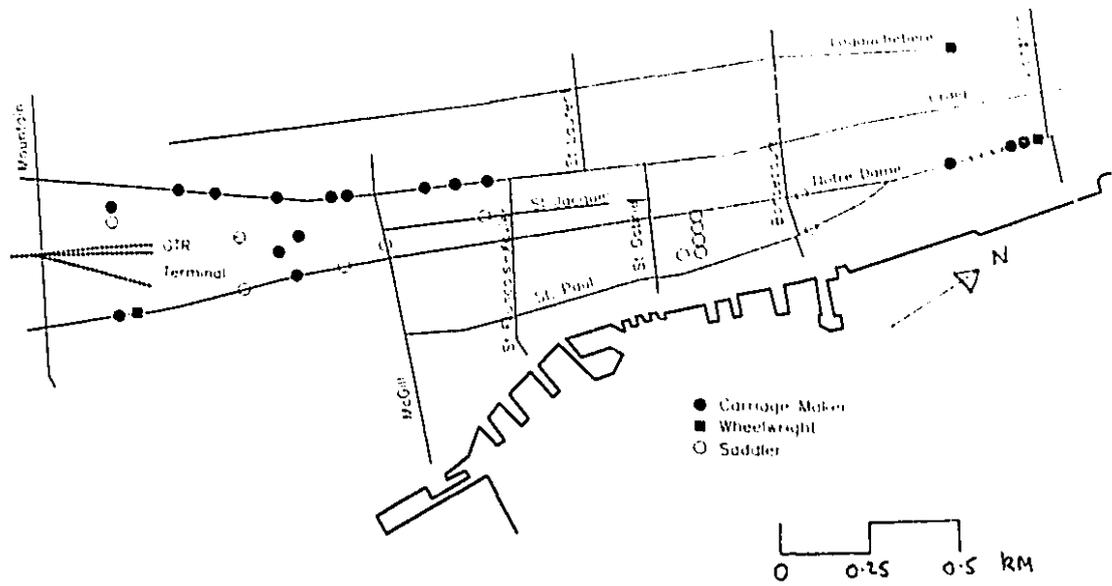
As Figure 5.10 shows the carriage-making and ancillary trades were

¹¹⁸ E.P. Duggan, "Machines, markets and labor: the carriage and wagon industry in late-nineteenth-century Cincinnati", Business History Review, 51, 3, 1977, p. 310.

¹¹⁹ W.W. Johnson, Sketches of the Late Depression; its Cause, Effect and Lessons With a Synoptical Review of Leading Trades During the Past Decade (Montreal: J.T. Robinson, 1882), p. 143.

¹²⁰ Martel, "L'industrie à Montréal", pp. 91-92. The quote is from p. 92.

FIGURE 5.10
THE LOCATION OF CARRIAGEMAKING FIRMS IN OLD MONTREAL
AND THE OUTER CORE, 1861



Source: City of Montreal, Rôle d'évaluation, 1861.

concentrated in three major districts of the city. The most important cluster was in Saint-Antoine along the major thoroughfares leading out of Old Montreal - Craig, Saint-James and Notre Dame streets - and surrounding the Grand Trunk Railway terminal. Here they had access to a good range of buildings, off-the-street customers, the elite market which worked just to the east and lived just to the north of the cluster, and the large cartering population which frequented the railway terminal. The carriage shops of Saint-Antoine were in constant competition. By 1856 Martin Gravelle had invested \$12,000 and was employing ten men at his carriage works on St-Antoine street, where "improvements ... are constant and marked, owing to the great competition, which also renders the profits very low".¹²¹ Suppliers of wood, leather and paint, as well as sub-contractors such as blacksmiths and wheelwrights were readily accessible in the surrounding and central area, and carriage makers acknowledged the advantages of being close to the centre where they could most easily discern changes of fashion and reach the largest markets.

The primary artery of the Saint-Lawrence district and the city's only north-south business street and thus its route north to the rural hinterland was Saint-Lawrence street.¹²² In 1861 this street was the focal point of the small manufacturing area that was the northern extension of Old Montreal. At this date, it had only fifty-five manufacturing firms and less than four per cent of the city's total rent. Firms were very small (a median rent of \$48, equivalent to a three or four

¹²¹ Celebration Committee, Montreal in 1856, pp. 46, 47.

¹²² Stewart, "Settling an 18th-century faubourg".

room flat) and made food, beverage and wood products predominantly. In Saint-Jacques, likewise, most firms were small (for example, two-thirds employed less than five workers in 1871), steam power and machinery were rare, and "production was largely artisanal or at a handicraft stage".¹²³ But even here a few larger industrial firms had been established such as Withall and Hood's soap and candle factory in 1850. One of its two buildings had three storeys and was 100 feet long. In 1856 they used steam power in the annual production of 20,000 boxes of soap and 10,000 boxes of candles, all of which were consumed in Montreal and Quebec.¹²⁴

The new spaces encircling the traditional manufacturing and commercial core of the city were created under the same forces which gave rise to manufacturing in Old Montreal. Even though the three districts were distinguished from each other in their industrial mix, they formed a manufacturing complex which offered firms many of the same advantages that were available in the city core. This point should not be pushed too far; there were some important differences between the districts. Saint-Jacques, for example, was the refuge of a small group of French-Canadian artisans who still clung, as much as they could, to the traditional forms of production. The development of Saint-Antoine and Saint-Lawrence as manufacturing districts, on the other hand, was more closely tied to the overspill of firms from Old Montreal. Here a wide variety of firms employing a wide range of productive strategies were established.

¹²³ Bradbury, "The family economy", pp. 73-76. The quote is from p. 74.

¹²⁴ Celebration Committee, Montreal in 1856, p. 49.

5.5 The East End: a Mid-Nineteenth-Century Industrial District

The centralization of small and medium-scale firms in the city core and the surrounding area was only one dimension of the city's industrial geography at mid century. As I mentioned in Chapters Two and Four, most discussions of nineteenth-century urban structure focus upon the centralization of firms in the city core. The importance of the central area has been confirmed for the case of Montreal. A large share of the city's firms and rent were clustered in the heart of the city - Old Montreal - and the surrounding Outer Core zone in 1861. While the central zones accounted for four-fifths of firms and three-fifths of rents, we must not neglect the more peripheral manufacturing spaces. In the dramatic spurt of industrialization of the 1850s an entirely new set of productive spaces was created to permit the deployment of new productive practices and the intensification of existing ones. These included substantial new industrial districts which were physically and socially 'distanced' from the city core. In Montreal in the period after mid century two non-central industrial districts can be identified: the West End and the East End. The purpose of this section is to describe some features of the industrial growth of the East End and to show how it differed from the central manufacturing complex and the large industrial district in the west.

The beginnings of an industrial district

Of the two most distant industrial zones evident in 1861 (see Table 5.3) the smallest was located in the East End. Its development was slow and steady, and

stretched back to the late eighteenth century. As early as 1782 Thomas Loid established a brewery at Saint-Mary's Current and petty commodity producers and a few manufactories clustered around it.¹²⁵ In 1785 John Molson became sole proprietor of the brewery and over the years established a number of other manufacturing enterprises (a distillery, a ship yard, and a foundry).¹²⁶ Despite the importance of the brewery to the city's economy, industrial growth was slow. After 1800 a number of ship yards operated to the east of Saint-Mary's Current. By the 1820s we count a brewery, two distilleries and a foundry¹²⁷, in 1851 seventeen manufacturing establishments.¹²⁸ At mid-century the only large ones were Molson's brewery, distillery and foundry. There were a few manufactories and small factories: a clay pipe works, a saw mill, and two rope walks. The rope walk of John Converse was one of the larger firms. The original works, established in 1825 on Parthenais street, by 1839 extended to "1,200 feet in length, the greater part (900 feet) two stories high, and another portion three stories." In the same year an additional building was constructed which by 1856 was a four-storey structure, forty by sixty feet. In these buildings, up to fifty hands using "patent" and "appropriate" machinery propelled by a steam engine transformed 150 to 250 tons of Russian hemp annually

¹²⁵ M. Denison, The Barley and the Stream: the Molson Story (Toronto: McClelland and Stewart, 1955), chap. 2.

¹²⁶ Denison, The Barley and the Stream; C. Soucy-Roy, "Le quartier Ste-Marie" (Maitrise es arts, Université Québec à Montréal, 1977), pp. 23-28.

¹²⁷ Denison, The Barley and the Stream, chaps. 2,4 and 5; Soucy-Roy, "Le quartier Ste-Marie", pp. 23-28; Tulchinsky, The River Barons, pp. 206-208.

¹²⁸ The data for the number of firms after 1851 comes from the rôle d'évaluation.

into "different kinds of cordage".¹²⁹ On the fringes of the district were brick yards, lime kilns and a small tannery, forced to the city edge by their noxious character. While a small and embryonic industrial base had developed over the course of the early nineteenth century, according to one writer, "à l'aube de la seconde moitié du XIXe siècle, le quartier Ste-Marie est véritablement devenu le territoire presque exclusif de la famille Molson".¹³⁰ While Sainte-Marie's growth continued to be dominated by the Molson and a few other families its economic activities and population were concentrated in the southern part of the ward, clustered along the major thoroughfares parallel and perpendicular to the river. This small cluster was located at the junction of water (the Saint-Lawrence river) and land (Papineau and Notre Dame streets) networks that were important factors behind the development of the small industrial district.¹³¹ At mid century few streets had been laid out and the district was made up of a mixture of wealthy and working-class housing. The area's infrastructure was non-existent except for a small section of sewer pipes that serviced the Molson cluster of enterprises.¹³²

Over the following decades, Sainte-Marie was to become an example of the

¹²⁹ The description for 1839 comes from N. Bosworth, Hochelaga Depicta or the Early History and Present State of the City and Island of Montreal (Montreal: William Greig, 1839), p. 179. By 1856 the Parthenais factory was "idle" and a new plant had been built at Saint-Gabriel Locks in the west end. See Celebration Committee, Montreal in 1856, pp. 40-41.

¹³⁰ Soucy-Roy, "Le quartier Ste-Marie", p. 28.

¹³¹ Soucy-Roy, "Le quartier Ste-Marie", pp. 23-25. Notre Dame street at this time was known as Saint-Mary street. Throughout this study I refer to it as Notre Dame.

¹³² Soucy-Roy, "Le quartier Ste-Marie", pp. 10-13.

early development of suburban industrial installations, their nucleation of new productive spaces, and the perennial restructuring and emergence of new productive spaces in every surge of growth of the city. By 1861 a small number of firms had been drawn by the magnet of the industrial cluster located at Saint-Mary's Current: small manufactories and factories were producing vinegar, soap, brooms and crackers. The forty manufacturing firms were clustered along Notre Dame street which ran parallel to the river (Figure 5.11).

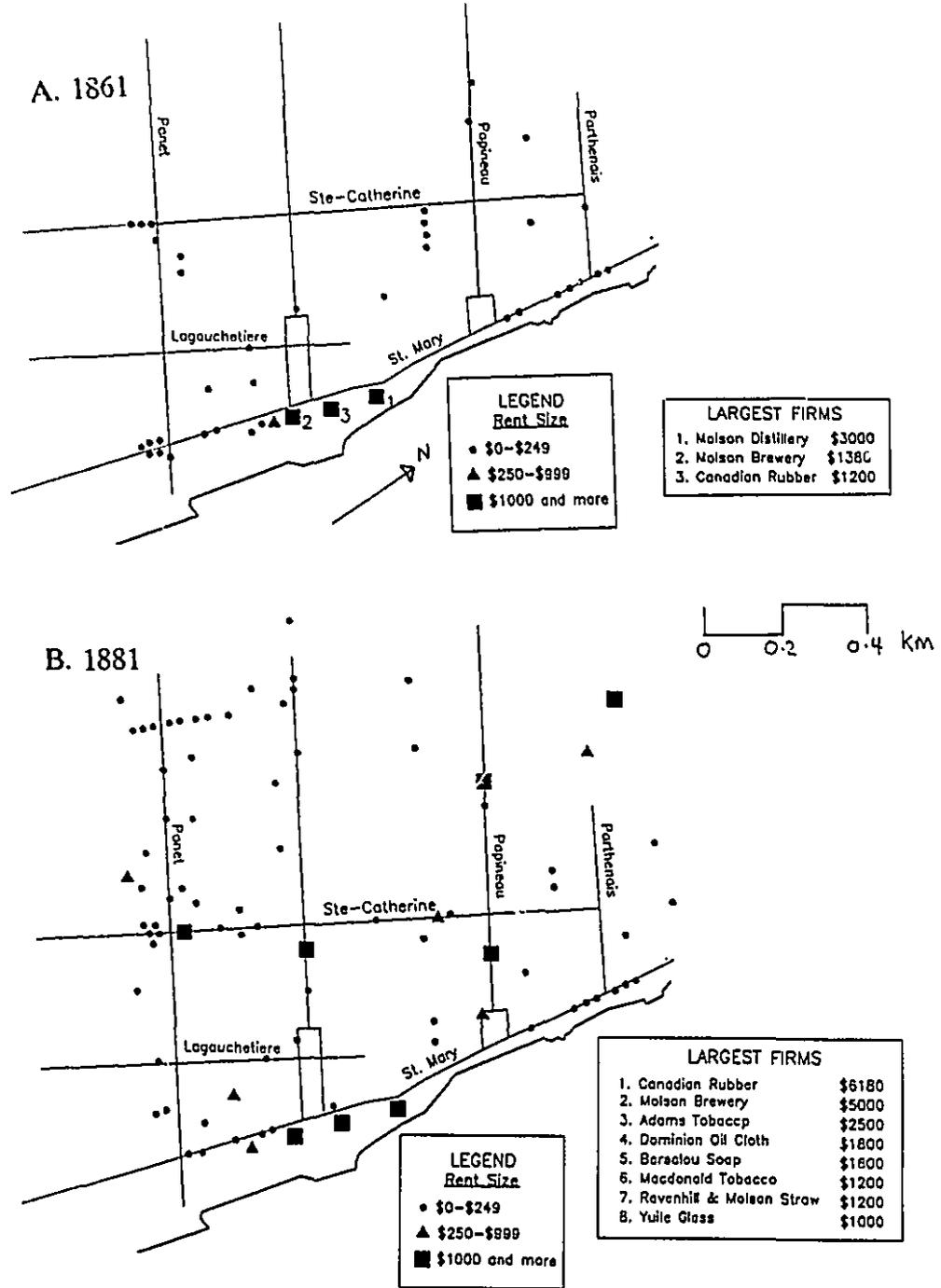
The industrial make-up of the East End in 1861 differed from that of core zones. East-End firms tended to be either small or very large: thirty one (out of forty firms in 1861) had rents less than \$150, while three - Molson's brewery, Molson's distillery, and Canadian Ruboer - were among the largest firms in the city. The district was polarized between a large number of small and heterogenous handicraft shops and manufactories serving a local market and a small number of mechanized factories of national stature.

The most significant addition in the 1850s was Canadian Rubber in 1853¹³³, an excellent illustration of the type of large scale and technologically advanced firm, setting up in the periphery, and creating new productive practices. In 1856 it housed 158 workers in five buildings worth more than \$55,000. In 1861 its rent was valued at \$1,200 per year. By 1871 the number of workers had risen to 370 and it was producing almost 650,000 pairs of rubber boots and shoes annually.¹³⁴ The founders

¹³³ In 1861 the company was known as Ashley Hibbard's rubber company.

¹³⁴ Celebration Committee, Montreal in 1856, p. 39; M. Bellavance and J-D. Gronoff, "Les structures de l'espace montréalais l'époque de la Confédération", Caliers de géographie de Québec, 1980, 24, p. 21.

FIGURE 5.11
LOCATION OF MANUFACTURING FIRMS IN SAINTE-MARIE, 1861 AND 1881



Source: City of Montreal, Rôle d'évaluation, Sainte-Marie ward, 1861 and 1881

of the firm included Ashley Hibbard who had been a "prime mover" in the construction of the Montreal, Portland and Boston Railroad, and Edwin Chaffee who had been a pioneer manufacturer in the United States and was responsible for one of the major innovations in the rubber manufacturing process. From the outset, the company had experience in both the transportation side, the crude rubber coming from Brazil, and in the manufacturing side. They imported experienced rubber workers from the United States and found a plentiful supply of cheap local labour in the form of women and children. In the 1860s Hugh Allan took control and incorporated the company.¹³⁵

For the most part, however, the firms operating in the East End were small manufactories and handicraft shops. These firms employed few workers, were small in scale, had not subdivided the production process to any substantial degree, and served local markets. The enterprises and most of the ward's workers still clustered around Molson's brewery on Notre Dame as the transportation and communication networks in the ward were still unsophisticated.¹³⁶

Consolidation and growth in the 1870s

While the East End did not participate fully in the long boom after the late 1840s, it took off in the 1870s as older firms - Molson's Brewery and Canadian Rubber - expanded, as several large-scale mechanized firms with elaborate divisions

¹³⁵ Roberts, From Three Men, chaps. 1 to 3.

¹³⁶ Soucy-Roy, "Le quartier Ste-Marie", pp. 28-34.

of labour settled in Sainte-Marie and further east in the new industrial suburb of Hochelaga. They clustered at the intersections of Papineau, Parthenais and Dézery streets with Notre Dame street (Figure 5.11). There was a doubling of the number of factories from seven in 1861 to fourteen twenty years later. In 1881 they include Adam's Tobacco factory (\$2,500 rent), Dominion Oil Cloth (\$1,800), William Yuile's glass factory (\$1,600), Barsalou Soap (\$1,600), Canada Thread (\$900), and the Victoria Straw Works.¹³⁷ The straw works, established by W.C Ravenhill and John Molson in 1876, was located in Old Montreal (Fortification street) where they made straw hats, but they promptly subdivided their plant and opened a bleachery in the eastern section of Sainte-Marie in 1877. In the following years they moved both the hat manufacture and bleaching operations to the new premises on Papineau street.¹³⁸

Associated with the burst of industrial development before 1881 was the growth of the district's population. From little over 10,000 in 1861 it had more than doubled over the next twenty years, reaching 22,700 by 1881. This growth was made up mainly of rural French Canadians: they increased from sixty-nine to eighty-one per cent of the ward's population in this period.¹³⁹ The development of the French-Canadian character of Sainte-Marie, "correspondant à une période d'appauvrissement

¹³⁷ The Molson closed their distillery in 1867. See Denison, The Barley and the Stream, chap. 12.

¹³⁸ The information about Victoria Straw was obtained from a careful perusal of Lovell's city directory for the period. Despite the financial backing of the Molson family, the straw company went out of business in 1884 with liabilities of almost \$100,000. See Canadian Journal of Commerce, February 8, 1884, pp. 184-185.

¹³⁹ Soucy-Roy, "Le quartier Ste-Marie", Tables 3.1 and 3.4, pp. 68, 83.

du quartier, classera de plus en plus les grandes familles bourgeoises qui avaient marqué le quartier, dont la famille Molson".¹⁴⁰ The worsening housing conditions and standard of living of Sainte-Marie workers was related to, on the one hand, the low wages that most of them received, and on the other, the land development policies of the major landowners. These owners happened to be the major employers such as Molson and Macdonald who built an inadequate number of houses, most of which lacked basic sanitary facilities.¹⁴¹ The construction of new housing was accompanied by the opening of new streets and the extension of existing ones, and the creation of several new institutions - parishes and schools - to service the growing population.¹⁴²

While Sainte-Marie continued to grow, both in terms of its industrial base and its population, another eastern area experienced a substantial amount of industrial growth in the 1870s. The newly emerging village of Hochelaga to the east of Sainte-Marie, was initially settled by the Montreal bourgeoisie who built expensive homes on the river, but in the 1870s, it was transformed into a complex and relatively complete industrial space. The population quadrupled (from a thousand to more than 4,000). As in Sainte-Marie, most were working-class French Canadians who worked in the large factories established in the 1870s such as the Macdonald tobacco factory, the Eastern Abattoir, B.J. Coghlin's railway supplies, the workshops of the

¹⁴⁰ Soucy-Roy, "Le quartier Ste-Marie", p. 42.

¹⁴¹ Soucy-Roy, "Le quartier Ste-Marie", chap. 4.

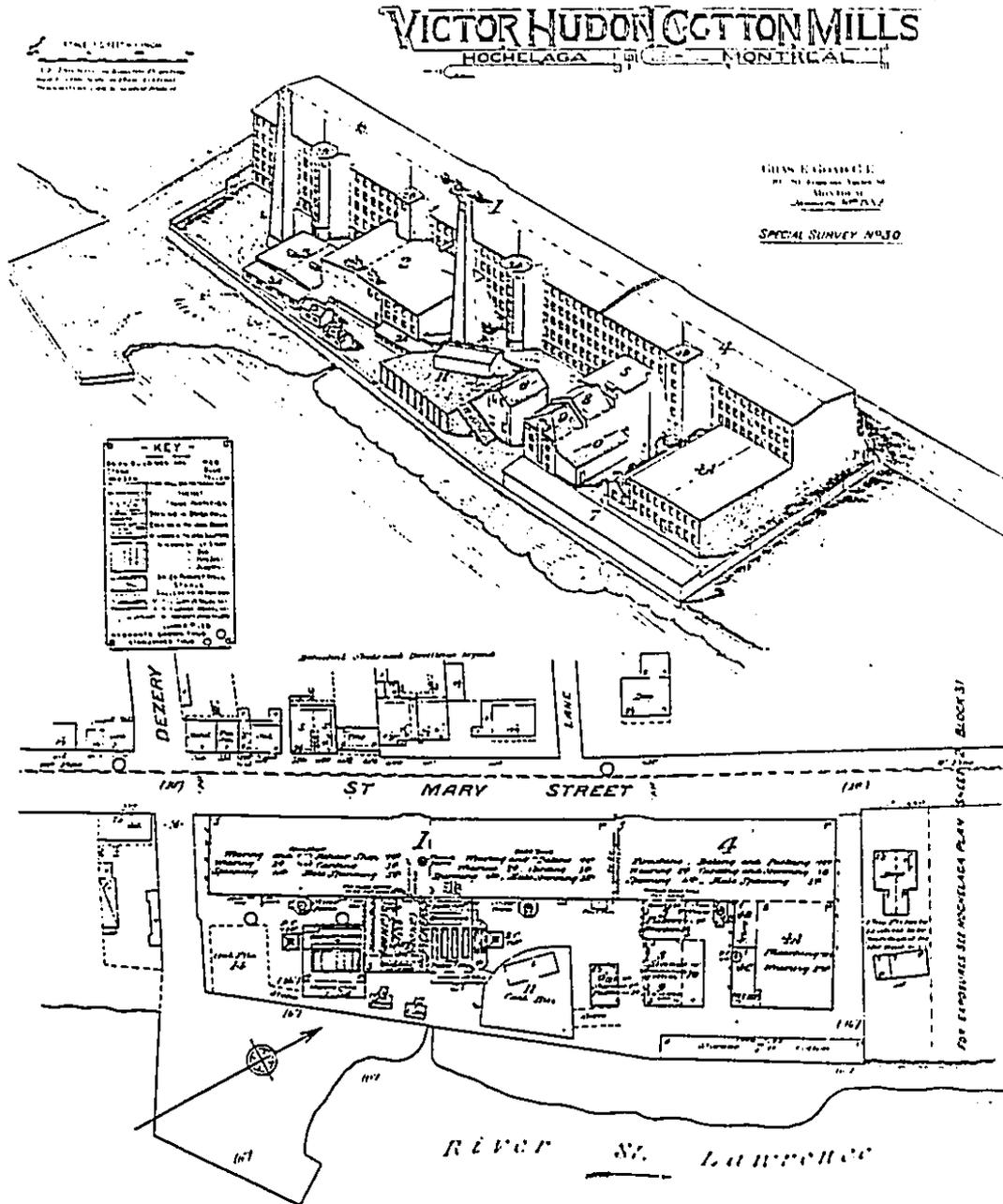
¹⁴² Soucy-Roy, "Le quartier Ste-Marie", pp. 13-18.

Quebec, Montreal, Ottawa and Occidental Railway (which later became Canadian Pacific), and the cotton factory of Victor Hudon. Hudon, who accumulated capital through his earlier career as a Montreal wholesale merchant, like the other manufacturers was attracted to Hochelaga by the prospects of cheap and abundant labour, access to the river for coal, and two new factors - provision by the municipality of a twenty-year tax exemption and the appropriate infrastructure, and access to the Canadian Pacific Railway terminus on Notre Dame street. The cotton mill built in 1874 at the corner of Notre Dame and D  z  ry streets was a five-storey structure, 215 by 80 feet, and was worth \$200,000 (Figure 5.12). On the first floor was the repair workshop and the storeroom for finished products; the second floor contained 300 looms; the third and fourth floors had 18,000 spindles for spinning cotton; and the final stages of manufacturing took place on the top floor. The looms and spindles were powered by a 600-horsepower steam engine. When working at full capacity the firm employed 600 workers. These employees, many of them women and children, worked in a highly regimented work setting where continuous-processing machinery dictated the pace of work.¹⁴³

Another example of the importance of the East End for the establishment of large firms employing new continuous-processing productive strategies is the

¹⁴³ See *Atelier d'Histoire Hochelaga-Maisonneuve De fil en aiguille: Chronique ouvri  re d'une filature de coton    Hochelaga en 1880* (Montr  al: n.p., 1985), Borthwick, *Montreal*, p. 143, and R.E. Rudin, "Victor Hudon" in *Dictionary of Canadian Biography* (Toronto: University of Toronto Press, 1990), vol. 12, pp. 455-457 for descriptions of Hudon's life and the mill. An analysis of the consequences of the nature of work in the textile mills see J. Ferland, "Syndicalisme 'parcellaire' et syndicalisme 'collectif': une interpr  tation socio-technique des conflits ouvriers dans deux industries qu  b  coise, 1880-1914", *Labour/Le Travail*, 1987, 19, pp. 49-88 and "In search of the unbound Prometheus".

FIGURE 5.12
THE HUDON COTTON MILL, 1882



Source: C.E. Goad, Victor Hudson Cotton Mills, Hochelaga, Montreal (Montreal: Goad, 1882), Special Survey No. 30.

Macdonald tobacco factory. Throughout the nineteenth century, with one important exception, the Montreal tobacco industry was located in the central core. The demand for small workshops close to the centres of finance and wholesaling, as in the industries I touched upon in the previous section, was a critical factor in the success of the most tobacco manufacturers.¹⁴⁴ The only exception to the centrality of tobacco firms was William Macdonald's tobacco factory in the East End. In 1858, at the age of twenty-three, Macdonald established a small tobacco factory on Water street on the eastern boundary of the Old Montreal. Within the space of ten years he had created the largest tobacco firm in Canada: by the late 1860s the five-storey building contained machinery and utensils valued at nearly \$40,000, while in 1871 Macdonald had capital to the value of \$250,000, employed 550 workers, and made more than half a million dollars worth of tobacco products.¹⁴⁵ In 1874, to accommodate expanding demand and to create a new productive space for production, Macdonald built a new factory at the corner of Ontario and Iberville streets on the Sainte-Marie and Hochelaga boundary. Built on an eight acre lot, the

¹⁴⁴ Tobacco manufacturers were reliant on the wholesaler for their raw tobacco leaf, most of which was imported from the United States and Cuba. Very few manufacturers could afford to have "Special Agents", as one large manufacturer did, who bought leaf for them directly from the tobacco-growing districts of Virginia, North Carolina and Kentucky. Decisions about when the best time to buy tobacco leaf and how to finance it could be most easily made through the gossip and knowledge channels of the central core. For many firms a small workshop which could accommodate five to twenty workers, some work tables and perhaps a few moulds, was to be found in the core. The centre was also close to the transportation networks that were necessary for shipping the tobacco and cigars to the surrounding towns and the larger cities throughout Canada.

¹⁴⁵ G. Pinard, Montréal: son Histoire, son Architecture (Montréal: La Presse, 1987), pp. 284-290; "William Macdonald", Maclean's, June 1959, pp. 24-25, 32, 36, 38, 40-41. For a description of the Water street factory see H.B. Small, The Products and Manufactures of the New Dominion (Ottawa: G.E. Desbarats, 1868), p. 147. The information for 1871 is from Canada, Manuscript Census, Industrial Schedules, 1871.

area of the factory's five floors was five and a half acres. While the move facilitated the installation of more than double the machinery that had been in the Water street factory, another important element to the move was the reorganization of the internal production space.¹⁴⁶ As the company stated in 1877, the new building was "planned and erected for this particular business, and with a view to economy of labour and perfection in manufacture; with system apparent in every department, and such perfect organization throughout."¹⁴⁷ Even if we take this description with a grain of salt, the obvious attention to the internal layout of the plant appears to be genuine. The typical downtown warehouse plant that they had formerly occupied was unable to provide the type of space that the company needed. Alongside the concern with the rationalization of space and production in the factory, Macdonald also split production from management. While production took place at the Ontario factory, the administrative concerns of the company were carried out at his office in the heart of the old city. By 1877 there were 1,100 employees in the new Macdonald factory, making up half of the city's total tobacco labour force.¹⁴⁸

At a time when most tobacco manufacturers sought a central location, one firm was able to break with this spatial constraint. Despite the large amount of fixed

¹⁴⁶ While it would be interesting to know if the machinery that was being installed in the Ontario plant was a new type, it is not possible to discern from the sources that I have been able to find.

¹⁴⁷ Globe and Mail, 20 April, 1877. There was also a concern for the lighting of the factory - to cut down lighting costs; and with fire protection. Macdonald had suffered from serious fires in the past and, despite "a novel method ... in the construction to make the building fire proof or as nearly as possible", the company was to suffer from more in the future.

¹⁴⁸ Globe and Mail, April 20, 1877.

capital in his Water street factory, Macdonald pulled up and moved to the very edge of the built-up part of the city. He was able to do this through a combination of the advantages of the East End and the installation of continuous-process machinery, the employment of cheap female and child labour, the capture of a particular segment of the tobacco market (Cavendish tobacco), and the use of specialized agents for purchasing raw materials. From an early date, Macdonald was able to shift his plant from the congested core area to a 'greenfield' site on the city periphery where new forms of plant rationalization could be introduced. In other words, a new set of productive practices were established and a new set of spatial milieus created that accommodated and also shaped these new practices.

In the years following the late 1840s the eastern portion of the city experienced bursts of industrial growth. The large-scale firms that were established there in this period acted as magnets to a host of smaller firms. This cluster in turn formed around much earlier constellations of industry that had been in existence since the late eighteenth century. The case of Sainte-Marie provides evidence that conflicts with the picture drawn by writers such as Scott who emphasize the concentration of production in the city core; by the mid-nineteenth century the eastern part of the city at Sainte-Marie had a well developed industrial base that became more firmly fixed with the influx of firms in the 1870s. While the early industrial development of the area was controlled by one family, after 1850 the establishment of an array of firms from a variety of industries which had been attracted by the conditions already created in the early stage of growth, led to the

emergence of a diverse industrial district. The firms that made up the emerging new and diverse industrial structure of Sainte-Marie (rubber, textiles, tobacco, and soap) had several characteristics in common: mechanization, a segmented and large labour force, a significant number of female and child workers, national and international markets, and large premises. These large firms found in Sainte-Marie and Hochelaga a suitable environment for production. Freed from the confines of obsolete physical structures and the production relations of the core, they established new production formats in a new productive space. While the provision of cheap and adequate housing was not forthcoming for a large number of the district's families, the laying down of basic infrastructures for industry went full steam ahead. Furthermore, land development was controlled by the employers. The Molson family, William Macdonald and others who owned large tracts of land in the ward were able to direct the timing, type and conditions of housing that was built.¹⁴⁹ Lastly, this new productive space was not fully determined or occupied by large enterprises. It contained a diverse array of workshops, manufactories, and smaller factories. The East End was a growing industrial zone where a particular array of productive strategies together developed with the formation of a particular productive space.

5.6 The West End: New Productive Strategies and the Growth of an Industrial District

While the eastern portion of the city had to wait to the 1870s before there

¹⁴⁹ Soucy-Roy, "Le quartier Ste-Marie", p. 109.

would be significant industrial growth, the western district of the city emerged as an important industrial zone by the early 1850s. To demonstrate the importance of this district within the Montreal context and to illustrate the wide range of productive strategies associated with industrial growth, I will provide a detailed discussion of the municipal ward of Saint-Ann which was the focus of industrialism in the West End in the three decades following 1850.¹⁵⁰ This examination of Saint-Ann provides evidence that urban peripheral industrial districts were in existence from as early as the mid-nineteenth century. This suggests that the explanation for the growth of industry on the periphery needs to extend past the arguments advocated by the transportation and transactional perspectives. The answer lies, it will be argued, in the manner in which a number of features interlocked. These include cyclical change, new technology and new industries, flows of fixed capital, linkages, and organizational structure. The broad range of possibilities and constraints under which firms operated - in other words a variety of productive strategies - created a diverse array of locational choices. The concentration of production in the city core is but one case. I will show in this section that a configuration of forces in the mid-nineteenth century also created the possibility for the development of another: the industrial suburb.

One such industrial suburb was that of Saint-Ann. As Table 5.3 shows, the West End in 1861, while only having fifteen per cent of the city's manufacturing firms

¹⁵⁰ I have published much of this material as "The development of an early suburban industrial district: the Montreal ward of Saint-Ann, 1851-1871", *Urban History Review*, 1991, 19, pp. 166-180.

accounted for more than a third of its rent, most of which was to be found in Saint-Ann. The West End had the largest average (\$529) and median (\$200) rents of all the zones in Montreal. From the mid 1840s to 1861 the area grew quite dramatically. In 1848 the same area had only thirty-one firms, most of them small in size and operating under handicraft conditions.¹⁵¹ The growth over the next ten to fifteen years took two major paths. First, and this distinguished the western part of the city from all others, was the emergence along the Lachine canal of a substantial number of large-scale, technologically-advanced firms from a select group of industries. The second path was the profusion of a large number of smaller firms employing a variety of productive strategies.

Early development of Saint-Ann

The twenty years following the depression of the 1840s were extremely important ones in the industrial history of Montreal, a central element of the city's rapid growth being the development of manufacturing alongside the Lachine canal in Saint-Ann's ward. While Saint-Ann's economy in the late 1840s was primarily artisanal, the ward's industrial and spatial character was very quickly transformed in the following decades. This was not lost on contemporary observers. One stated that "[a] walk along the banks of the Lachine canal and the St. Gabriel Locks, will convey to the observer a forcible impression of the extent and importance of the factory

¹⁵¹ The number is taken from the 1848 rôle d'évaluation.

interests of the City".¹⁵² After the 1840s a technologically-advanced, hydraulically-based, energy-intensive form of production was superimposed upon small-scale artisanal production, which led to a reorganization of the ward's social character. Concomitant with this industrial transformation was a reorganization of its geography, as the Lachine canal on the fringe of the built-up area became the locus of the new form of production introduced with the broad burst of growth that occurred after the late 1840s.¹⁵³

The redevelopment of the Lachine canal in the mid 1840s and the technological revolution of the boom starting in the late 1840s, transformed the nature of Saint-Ann's industry. Prior to this, petty commodity production was the over-riding feature of the ward's manufacturing concerns. Table 5.7 indicates the antecedents of industrial capitalist production, the early introduction of machinery and steam power. As early as 1831, the *Montreal Gazette* claimed that Griffintown "has more machinery in operation within its limits than any other portion of Montreal".¹⁵⁴ The Eagle Foundry, for example, had an assortment of turning lathes, grind stones, and trip hammers, all powered by an eight horsepower engine. The other firms employed machinery and steam power. The census taken in 1842

¹⁵² Commercial Sketch, p. 5.

¹⁵³ For the important changes at the canal see L. McNally, Water Power on the Lachine Canal, 1846-1900 (Ottawa: Parks Canada, 1982); Tulchinsky, The River Barons; Willis, The Process of Hydraulic Industrialization.

¹⁵⁴ 16 July, 1831. Griffintown, just west of the city core, was laid out between 1815 and 1830 by Thomas McCord. It was the only fully developed part of Saint-Ann before 1851 except for a small population of Irish immigrants that settled alongside the north bank of the canal adjacent to Griffintown in the 1840s. See Willis, The Process of Hydraulic Industrialization, p. 96.

TABLE 5.7
 FACTORIES IN SAINT-ANN, 1831-1856

		1831	1842	1851	1856
FOOD	Flour mills	4	4	1	3
	Linseed oil	1	2	2	1
	Smut mill	1			
	Breweries		2	2	2
	Sugar refinery				1
METAL	Foundries	2	2	6	7
	Nail	1	2	3	4
	Machine shops			2	4
	Engine works				1
	Threshing machines				3
	Edge tool works				2
	Scale works				1
CHEMICAL	Soap	1	2	3	3
	Varnish works				1
LEATHER	Tannery	1		1	1
OTHER	Comb manufactory	1			
	Organ manufactory			1	1
	Rubber factory				1
	Clothing factory				1
	Tobacco factory				1
	Roofing material				1
	Carriage factory				1
TEXTILE	Rope works		1		
	Cotton factory				1
WOOD	Saw mills		1	3	6
	Stave factory				1
	Chair factory				1
	Lasts factory				1
TOTAL		12	16	24	49

The list is doubtless incomplete. Dow brewery which was established in the first decade of the eighteenth century, for example, is missing. The listings for 1851 and 1856 do not include the numerous petty commodity producers such as bakers, coopers, blacksmiths, saddlers and wheelwrights.

Sources: Montreal Gazette, 16 July, 1831. City of Montreal, Rôle d'évaluation, Saint-Ann ward, 1851 and 1856.

enumerated sixteen manufacturing establishments in Saint-Ann, one third of the whole city. In the eleven years since 1831, if the census is to be believed, there had been little change to the number and type of 'modern' firms operating in the ward. What the newspaper report and the census enumerators fail to tell us is the extent to which artisanal production was taking place at this time. They provide information only for firms operating under 'factory' conditions, although it seems likely that the small artisan shop, employing a journeyman or two, was the principal form of production before the late 1840s: as one writer has stated Saint-Ann was characterized by a "small and individualized craft system of production", with an embryonic industrial base centred on machinery and steam power.¹⁵⁵

The transformation of Saint-Ann's industry after mid century

From 1847 the City of Montreal rôle d'évaluation makes it possible to present a more balanced picture of the area's industry. What it shows is that from these early beginnings, where factory production was a secondary component of Saint-Ann's manufacturing base, that the district would experience tremendous changes in the scale, type and location of industry. In order to demonstrate the changing industrial structure and geography of the area I collected rental tax valuations for all manufacturing firms in the ward, at five-year intervals from 1851 to 1881. From these data, it is possible to present a detailed picture of the individual firms operating in each of the time slices, their location, and their scale (rent). For clues to the

¹⁵⁵ Willis, The Process of Hydraulic Industrialization, p. 168.

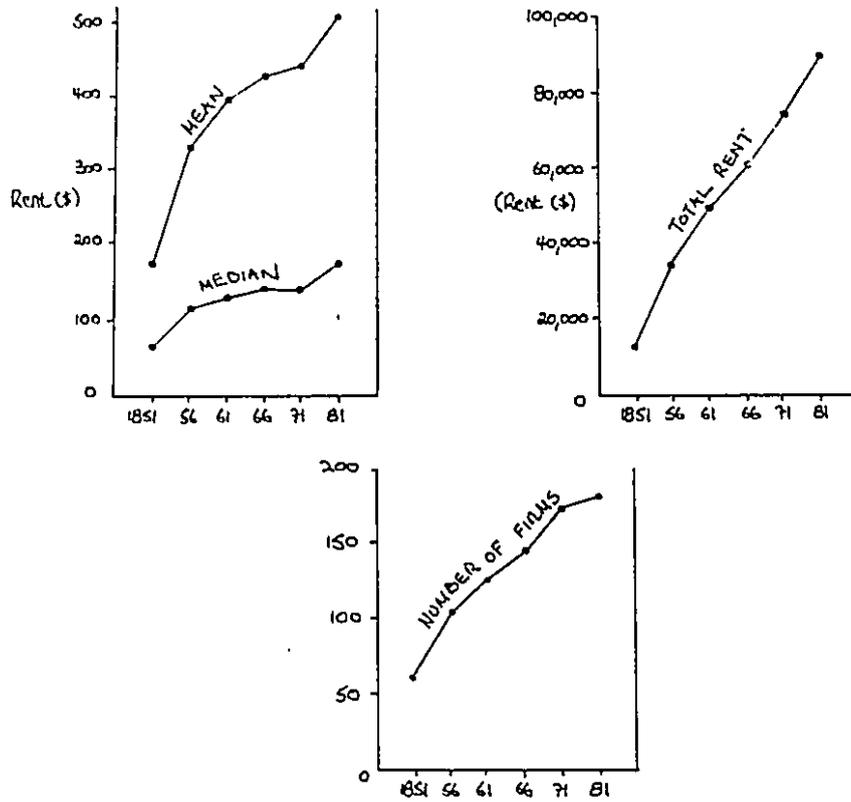
production formats in operation and the particular work-spaces built in these intervals, I have relied upon descriptions of firms and industries from secondary studies and contemporary sources such as newspapers, government reports and booster literature.

One feature of Saint-Ann's industrial transformation after the late 1840s was the dramatic growth in the number of manufacturing firms. As Figure 5.13 shows, from 1851 and 1881 the number of firms in the ward tripled. Each decade showed a significant increase in the number of firms except the depression decade of the 1870s. Median rent also tripled (from \$60 in 1851 to \$180 in 1881), but the aggregate increased more than ninefold, indicating, even when allowing for inflation, the importance of larger-than-average firms. The distribution of sizes is shown in Table 5.8. In 1851 more than eighty-seven per cent of all firms had rents below \$300, in 1881 only sixty-one per cent. The most dramatic change took place between 1851 and 1856: small establishments (rents under \$100) were stable in number, but their relative importance diminished (sixty-two to forty-two per cent), while the number of establishments paying very large rents increased.

The maps in Figure 5.14 show the location of all manufacturing firms in Saint-Ann in 1851 and 1881, and we see the development of the Lachine canal area relative to Griffintown.¹⁵⁶ Enterprises such as Bartley and Dunbar's St. Lawrence Engine Works, located at the basin of the Lachine canal, were responsible for the

¹⁵⁶ Although the workshops of the Grand Trunk Railway were located in Saint-Ann they were not assessed during this period. They have been excluded from the empirical analysis here. In later years the shops had the largest rent of all industrial establishments in the city and probably did in this period as well.

FIGURE 5.13
SAINT-ANN MANUFACTURING FIRMS BY RENT, 1851-1881



Year	No. of Firms	Rent (\$)		
		Median	Mean	Total
1851	63	60	173	10,912
1856	101	120	338	34,152
1861	125	130	400	49,940
1866	142	144	429	60,874
1871	175	144	438	76,700
1881	179	180	506	90,496

Source: City of Montreal, Rôle d'évaluation,
Saint-Ann ward, 1851-1881

TABLE 5.8
MANUFACTURING FIRM SIZE IN SAINT-ANN, 1851-1881

Rent (\$)	1851		1856		1861		1866		1871		1881	
	No	%										
0-99	40	63	43	43	51	41	55	39	68	39	60	34
100-299	15	24	25	25	29	23	34	24	42	24	49	27
300-799	4	6	21	21	28	22	34	24	42	24	37	21
800-1599	3	5	8	8	10	8	12	8	14	8	22	12
1600 +	1	2	4	4	7	6	7	5	9	5	11	6
Total	63	100	101	100	125	100	142	100	175	100	179	100

Source: City of Montreal, Rôle d'évaluation, Saint-Ann ward, 1851-1881

dramatic growth in the western part of the ward. Their 160 men and apprentices manufactured boilers, engines, iron and brass castings, and millwork. Their factory, valued at \$1,000 in 1856, included a smithy, boiler shop, foundry, pattern shop, and finishing shop. The centrepiece of Redpath's Sugar Refinery, also a canal site, was a seven-storey stone and brick edifice that could produce 6,000 barrels of refined sugar monthly (see Figure 5.15).¹⁵⁷ As one report noted,

The buildings form a magnificent pile of stone and brick. The main erection measuring one hundred and sixty feet in length, by forty-four, of the same height, exclusive of the boiler house, and charcoal kilns. The whole being by far the largest manufacturing erection in the city.¹⁵⁸

A year after its opening in 1855, the mammoth building had a rent of \$4,000. contained a large amount of machinery and employed 100 employees.¹⁵⁹ By 1871 with more than a quarter of a million dollars sunk into the plant, the company employed two hundred and twenty workers in the manufacture of sugar valued at more than \$2.5 million.¹⁶⁰ In the same year, 790 workers were employed in the Grand Trunk Railway shops in Point Saint-Charles where they built locomotives, freight and passenger cars, as well as railway parts such as castings, boilers, springs, iron wheels, lamps and axles.¹⁶¹

¹⁵⁷ Celebration Committee, Montreal in 1856, pp. 40, 43-44.

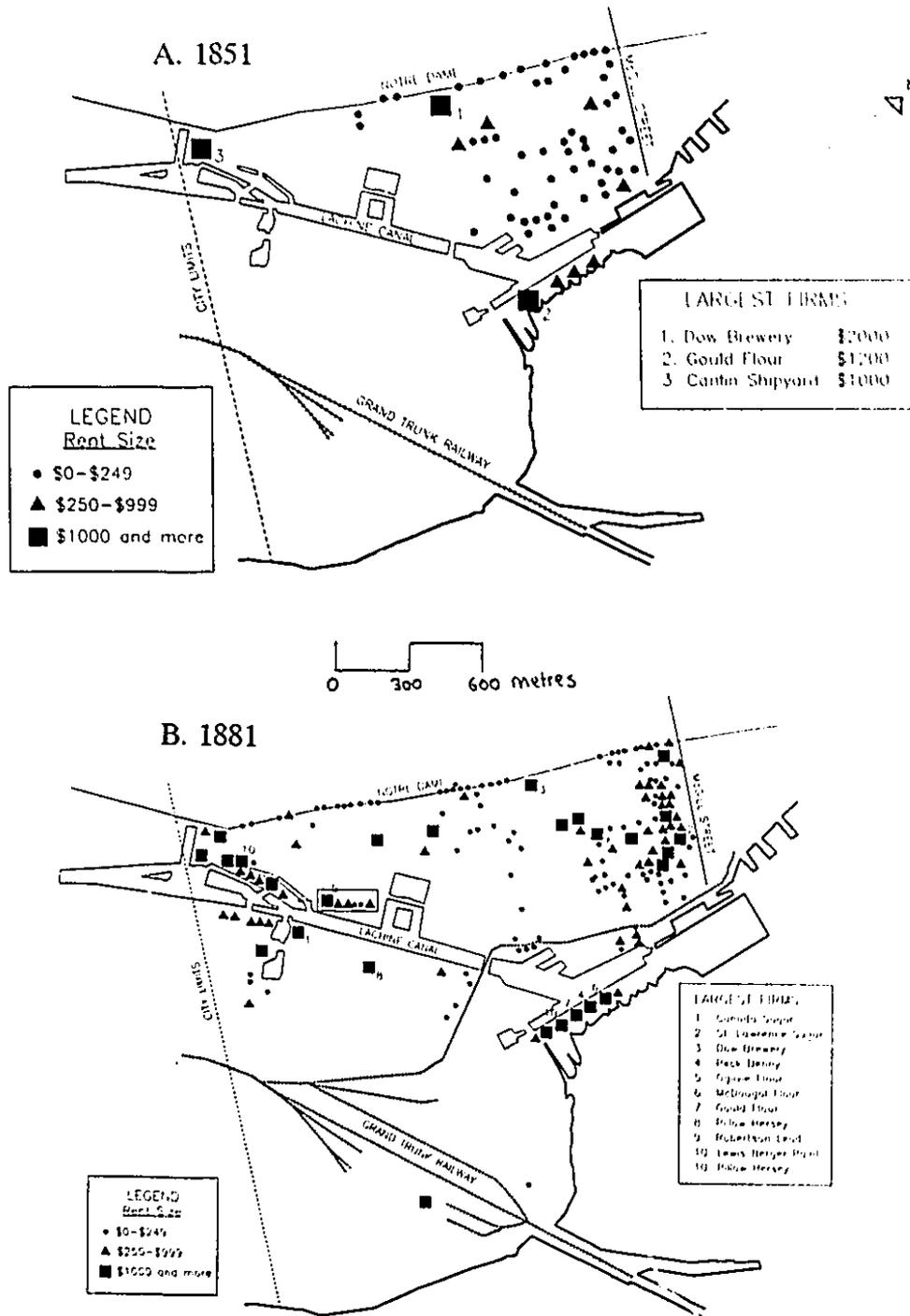
¹⁵⁸ Montreal Witness, March 7, 1855 quoted in Feltoe, Redpath, p. 46.

¹⁵⁹ Feltoe, Redpath, p. 50.

¹⁶⁰ Canada, Manuscript Census, Industrial schedules, 1871.

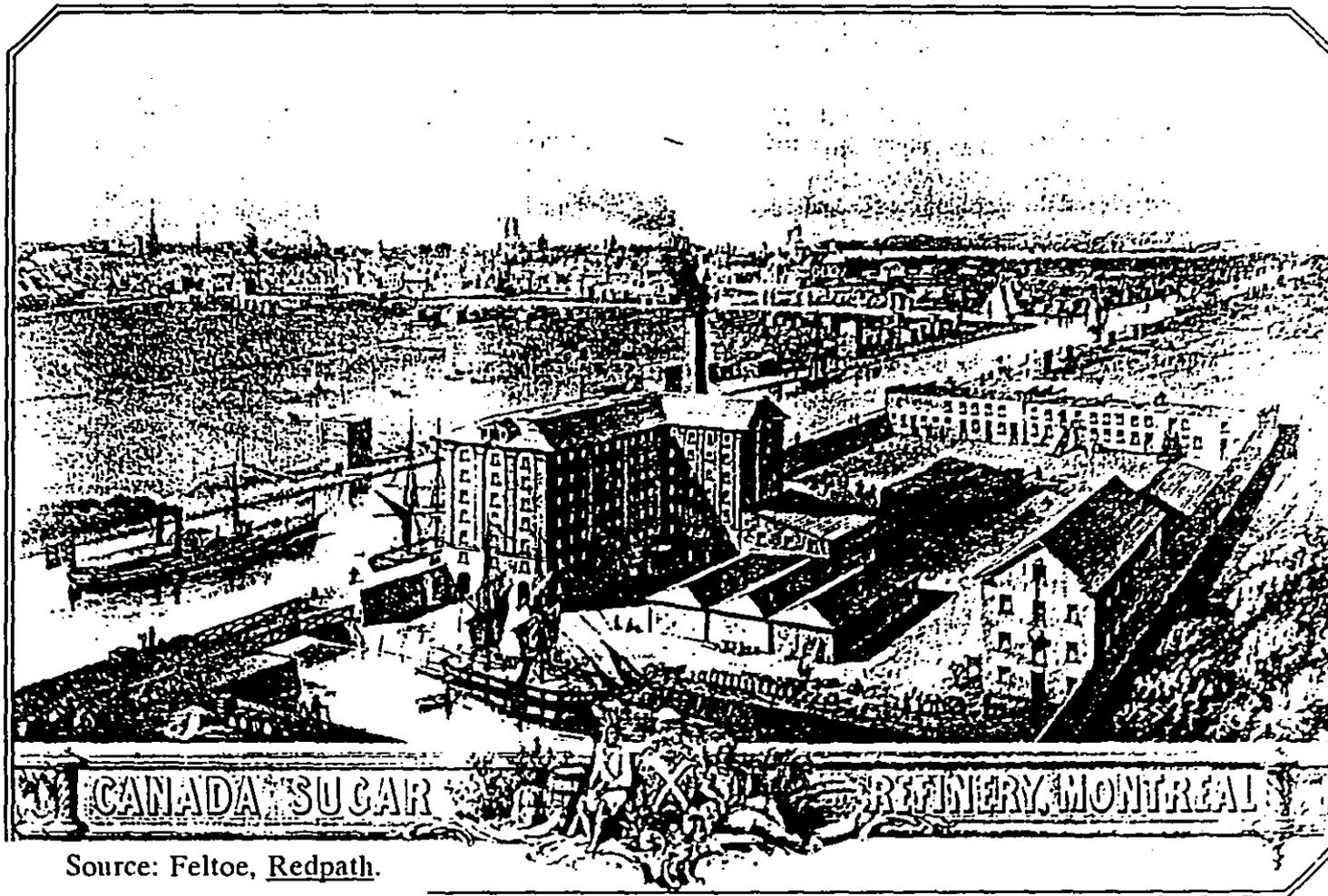
¹⁶¹ Craven and Traves, "Canadian railways as manufacturers", pp. 255-273.

FIGURE 5.14
LOCATION OF MANUFACTURING FIRMS IN SAINT-ANN, 1851 AND 1881



Source: City of Montreal, Rôle d'évaluation, Saint-Ann ward, 1851 and 1881.

FIGURE 5.15
VIEW OF THE REDPATH (CANADA) SUGAR REFINERY, CIRCA 1856



Source: Feltoe, Redpath.

Tulchinsky estimates that about thirty factories were established in the ward between 1847 and 1854, \$2 million was invested and 2,000 jobs were created.¹⁶² The impetus was the large investments made by outside entrepreneurs and loans extended by Montreal banks. Entrepreneurs were responding to the new market opportunities. William Allen's chair factory, for example, produced "chiefly for home consumption", his chairs were "fast superseding those of American manufacture"; and the threshing machine manufacturer, B.P. Paige, stated, "there is increased demand both for home consumption and export".¹⁶³ Skilled labour from Britain and the United States, and unskilled labour from Ireland and the countryside surrounding Montreal also stimulated development. Take the case of the cotton cloth factory of F.W. Harris located at St. Gabriel locks. In the manufacture of "seamless bags and denims" Harris employed seventy workers, "nearly all women and children". The moulders employed in Saint-Ann's foundries whose work "require(d) great skill" were essential to the manufacture of castings. The sugar boiler at the new Redpath refinery was brought in from an American refinery.¹⁶⁴ Moreover, the state offered industrialists something more than what Tulchinsky has termed "beneficent encouragement"; it heavily subsidized the reconstruction of the Lachine canal to permit the generation

¹⁶² The River Barons, p. 228.

¹⁶³ Celebration Committee, Montreal in 1856, pp. 42, 48. Despite the growing extent of the market, many manufacturers were limited by its size. The foundry of Ives and Allen were forced "to keep a large variety of manufactures ... instead of confining themselves to a few articles." See Canada Railway Advertising, Montreal Business Sketches, p. 37.

¹⁶⁴ Celebration Committee, Montreal in 1856, p. 40; Canada Railway Advertising, Montreal Business Sketches, p. 36. Feltoe, Redpath, p. 48.

of more than 8,000 horse power.¹⁶⁵

Despite the increasing size of firms, Saint-Ann's industrial structure was characterized by a diversity of scale, industry, and technological organization. Even when large capital investments were flowing into Redpath's Sugar Refinery or Gould's Flour mill, a large number of small and medium-size firms dotted the ward's landscape. The variety of scales is shown in Table 5.8. In 1871, for example, almost forty per cent of the ward's firms had rents less than \$100, forty-eight per cent between \$100 and \$799, and thirteen per cent over \$800. The development of large-scale firms in leading sectors did not discourage the growth of smaller firms. The coexistence of small and large were in fact inseparable aspects of the development of Saint-Ann.

Another feature of Saint-Ann's industry was the diversity of industries. Fifty-three (eighty-four per cent) of the ward's firms belonged to the food, metal, chemical, and wood sectors in 1851, while only 126 (seventy per cent) did thirty years later. Although these sectors' share of the aggregate rent remained steady over the period (around eighty per cent), there was increasing diversity. Many new firms in other industries sprung up. Textile, boot and shoe, broom, clothing, and tobacco factories became increasingly more common as the period drew on. They were, however, generally smaller in size than those in the dominant sectors. Even the four major sectors were characterized by great variety; in the food sector in 1871 the flour mills,

¹⁶⁵ Tulchinsky, The River Barons, pp. 228-231. See also McNally, Water Power on the Lachine Canal; Willis, The Process of Hydraulic Industrialization. The water-power figure comes from Patterson, Statements ... 1868, p. 120.

brewery and sugar refinery had a mean rent of over \$4,000, while the thirteen bakeries and confectioneries averaged only \$107.

In this period the water and steam powered mills replaced "the various artisan boutiques and manually-powered shops as the more technically advanced form of enterprise".¹⁶⁶ Despite this, the various establishments in Saint-Ann also exhibited various degrees of mechanization, and alternative technologies. The metal industry in 1861 is a good example; its forty-two firms that made up the industry had a modest median rent of \$160. At one end of the spectrum, foundries, nail factories, rolling mills, lead pipe makers, and threshing machine manufacturers were large and employed newer technologies and different forms of labour. In 1855 Thomas Peck's nail and spike factory at the Lachine basin had six large and nine small nail machines, a slitting machine and two spike machines. At J.D. Bigelow and Nile's and at the Holland and Dunn nail factory (both were located a few metres from Peck's), there were in operation thirty and thirty-four nail machines respectively.¹⁶⁷ By 1871 the five nail factories along the canal were producing ninety per cent of Canadian output. Their success can be attributed to technological advances and vertical integration. In order to manufacture the nail plate, two of the nail manufacturers in the late 1850s built rolling mills, while introducing puddling furnaces in the early 1860s. By 1864 the new rolling mill of Holland and Sons, located just down the canal from their nail factory, was fitted up with a 100 horse-power steam engine, four

¹⁶⁶ Willis, The Process of Hydraulic Industrialization, p. 51.

¹⁶⁷ Canada, Report of the Commissioners of Public Works for the Year Ending 31st December, 1855 (Toronto: Lovell, 1856), Appendix 31.

puddling furnaces and several "powerful" rollers.¹⁶⁸ The skilled employees in Robert Scott's Edge Tool works in 1856 worked with a vast assortment of machines: trip hammers, polishing frames, auger lathes, grind stones jammers, a friction wheel, an oval lathe, a circular saw, a wood polishing machine, and a lip strapping machine.¹⁶⁹

At the other end of the spectrum we find nineteen blacksmiths and an assortment of spike makers, machinists, platers, lock makers, scale makers, and file cutters, all small in scale, relying to varying extent on hand work. They occupied specialized market niches, acted as suppliers or sub-contracted to larger firms. Take blacksmithing, for example,

[l]a grande majorité des entreprises forgent des clous et des fers-à-cheval, d'autres fabriquent aussi des outils pour tailler la pierre, des haches, différentes ferrures pour les maisons: des tarjettes, des poignées de portes et des ferrures de charpentes, mais aussi pour les voitures et les bateaux.¹⁷⁰

The blacksmithing shop was small in size: forty-one of the city's forty-nine establishments in 1871 had capital of less than \$2,500 while the average number of employees was four.¹⁷¹ In contrast to the multitude of small, hand-working firms were those that built up more sophisticated organizational structures.

¹⁶⁸ "Manufacturing Industry of Montreal", Montreal Gazette, July 26, 1864.

¹⁶⁹ McNally, Water Power on the Lachine Canal, pp. 66-77. For a description of the manufacture of nails in Peck's factory see Montreal Business Sketches, pp. 9-12, for Scott see Canada, Report of the Commissioners of Public Works ... 1855.

¹⁷⁰ Martel, "L'industrie à Montréal", p. 82.

¹⁷¹ Martel, "L'industrie à Montréal", pp. 81-82.

An example of an early vertically-integrated firm was Augustin Cantin's Montreal Marine Works.¹⁷² Cantin learnt the ship-building trade through service in a number of Montreal and New York ship yards. In 1841 he started his own yard near the Canal Basin, which failed two years later. In 1846 he reopened, this time at a new ship yard further along the canal at Saint-Gabriel Locks. In 1850 Cantin expanded the yards and with an investment of \$10,000 built a new dry dock. At this date he also began to export steamships, although the vast share of his products remained the domestic market. By 1856 his new shipyards covered more than fourteen acres and consisted of two basins, a saw mill and an engine foundry where between 200 and 250 hands had made seven steam and a number of smaller vessels in the preceding year. Cantin had a vertically-integrated, and large, shipyard capable of performing nearly all the operations required for the production of ships. Much of the lumber needs of the company were obtained from the saw mills with their water-powered upright and circular saws. In the other departments the workers operated lathes, planes and "a great variety of other machinery" with the aid of a twenty horse-power condensing beam engine.¹⁷³ Cantin also had draughting and modelling rooms where plans for the ships could be drawn up. Cantin's ability to create a sprawling ship yard where all the necessary parts of the steamships could be constructed is a testament to the growing scale of industry at mid century.

¹⁷² Celebration Committee, Montreal in 1856, p. 41; Tulchinsky, The River Barons, pp. 208-210 and "Augustin Cantin", Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1990), vol. 12, pp. 158-159.

¹⁷³ Celebration Committee, Montreal in 1856, p. 41.

Nonetheless, Cantin had not fully captured the ship business. There were a number of marine engine foundries and saw mills - like the Eagle Foundry and Shearer's sash and door factory - which either subcontracted out directly to the ship yards or to buyers, or provided materials for the ship yards.

The well-developed character of technology in other industries is also evident among the firms established in Saint-Ann. In the wood-processing industry, Canada was more technologically advanced than that of the United States.¹⁷⁴ James Shearer's sash and door factory located close to Redpath's refinery produced doors, sashes, blinds, mouldings, and architraves with "ingenious machinery" which "do very much of the work". A feature of the Grand Trunk shops was the constant up-dating of and experimentation with new machines and new forms of shop organization.¹⁷⁵ The manufacture of putty and paints in the chemical factory of Lyman, Clare and Company was "performed by powerful machinery".¹⁷⁶ In 1855 the Lyman, Clare firm employed a vast array of machines and equipment: rollers, chasers, power presses, power pumps, strainers, drug chasers dye wood-cutter, circular saw, paint mixer, putty mill and a triturator. The Commissioners of Public Works report of 1856 indicates that the firms along the Lachine, without exception, employed a wide variety of modern machinery.¹⁷⁷

¹⁷⁴ McNally, Water Power on the Lachine Canal, p. 77.

¹⁷⁵ Craven and Traves, "Canadian railways as manufacturers", pp. 273-279.

¹⁷⁶ Celebration Committee, Montreal in 1856, p. 42; Montreal Business Sketches, p. 15.

¹⁷⁷ Canada, Report of the Commissioners of Public Works ... 1855.

By 1881 Saint-Ann can be described as a complex of linked, diverse, and horizontally disintegrated firms. Linkages extended within industries and between industries and firms of different sizes. John McDougall's foundry manufactured railway car wheels that found their way to the Grand Trunk Railway shops in Point Saint-Charles.¹⁷⁸ Coopers provided barrels and kegs for all trades, and blacksmiths applied their skills in carriage-making. Shearer's sash and door factory built its mouldings and much of its other woodwork for steamship builders. George Brush's Eagle Foundry manufactured nearly all the steam engines used in the vicinity's steamers. In 1876, George Drummond told a government committee that the Redpath Sugar indirectly employed at least seventy-five workers in such trades as coopering and carting besides the 300 employees in the refinery proper.¹⁷⁹ In the construction of his refinery, Redpath ordered cisterns from the Rogers and King foundry, 11,000 settling moulds from the Rodden foundry, and boilers from Bartley and Dunbar's engine shop.¹⁸⁰

Saint-Ann's firms were not only connected by direct linkages: the existence of a diverse labour force also played a major role. In the thirty years following 1851, the

¹⁷⁸ M. Milot, "John McDougall" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1990), vol 12, pp. 620-621.

¹⁷⁹ Canada, "Report of the Select Committee", 1876, Appendix 3, p. 37; McNally, Water Power on the Lachine Canal, p. 78; Celebration Committee, Montreal in 1856, p. 47. The other foundry that produced engines for steamships was St. Mary's in the east end. It went out of business with the advent of the canal's factories.

¹⁸⁰ Feltoe, Redpath, pp. 41, 47, 48.

ward's population nearly tripled from 7,455 people to more than 20,000.¹⁸¹ The vast number were employed in the surrounding factories and workshops.¹⁸² In 1861, and for the rest of the century, more than ninety per cent of all household heads were manual workers.¹⁸³ The ward had concentrations of workers in skilled occupations such as machinists, moulders and coopers. A large number of these skilled workers were from Britain and the United States. There was also a large number of unskilled workers: labourers accounted for more than one-third of the ward's household heads. To the north of Saint-Ann, in the southern part of Saint-Antoine, there were also a substantial numbers of workers. A large number were French Canadians.¹⁸⁴ With this large and varied labour pool to draw on, an essential component of production was met.

The changing industrial geography of Saint-Ann

The radical changes taking place in the industrial character of Saint-Ann went hand in hand with the reorganization of the location of industry. Although Griffintown had been the traditional manufacturing core of the ward, in the

¹⁸¹ A.H. Conter, "The origins of a working-class district: a portrait of Saint-Ann's ward in the 1850s", (Undergraduate paper, McGill University, 1976), p. 4.

¹⁸² B. Young, In Its Corporate Capacity: the Seminary of Montreal as a Business Institution, 1816-1876 (Kingston and Montreal: McGill-Queen's University Press, 1986), p. 139; Conter, "The origins of a working-class district".

¹⁸³ Lewis, "The segregated city", Table 3, p. 143.

¹⁸⁴ Bischoff, "Des forges du Saint-Maurice", pp. 19-24; D.B. Hanna and F.W. Remiggi, Montreal Neighbourhoods (Canadian Association of Geographers, May 1980), pp. 5-6; Lewis, "The segregated city".

mid-1840s a new set of firms - larger and more capital-intensive - would locate on the rural fringe of both the ward and the city. At the time of the redevelopment of the canal in the mid-1840s the land of the Saint-Sulpician seminary bordering the Lachine canal was still being used for "the leasing of pasture, the sale of farm produce, and the use of farm workers and horses to haul firewood".¹⁸⁵ According to the Royal Commission of 1887 looking into the leasing of water power at the Lachine canal, "at the date (1851) of the lease of the power at... (Saint-Gabriel) lock, it was at the outskirts of the city".¹⁸⁶

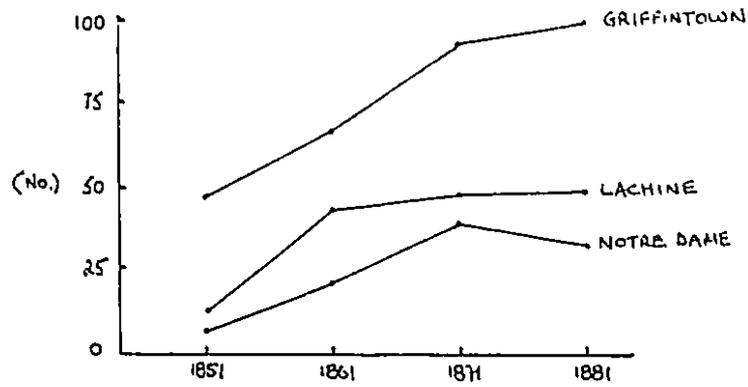
In the first years of the recovery from the depression of the 1840s the industrial face of Saint-Ann was transformed. The establishment of large-scale mills, first at the canal basin and later at Saint-Gabriel locks, created an industrial district that mirrored the break with the pre-industrial past. It was during the early years of the 1850s when the shape of the new geography was created.¹⁸⁷ The ward's sixty-three firms of 1851 were concentrated in Griffintown. As Figure 5.16 indicates, Griffintown's forty-six firms (seventy-three per cent) accounted for almost half of the ward's total rent. They were generally small in scale, although some larger establishments such as Brush's Eagle Foundry (\$800) existed. Along Notre Dame

¹⁸⁵ Young, In Its Corporate Capacity, p. 133.

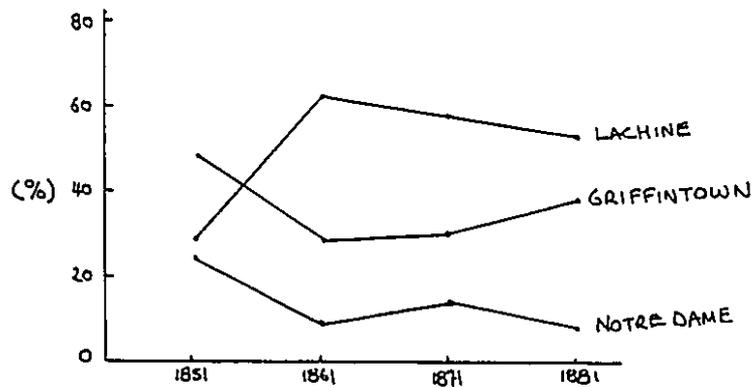
¹⁸⁶ Canada, Report of the Royal Commission on the Leasing of Water Power, Lachine Canal (Ottawa: Maclean, Roger and Company, 1887), p. 7.

¹⁸⁷ In order to capture this geography, all firms were assigned to one of three areas. Griffintown is the part of the ward east of McCord street. The Canal area is the zone along the canal and includes Saint-Gabriel Locks as well as Mill, St-Patrick, and subsidiary streets running close to the canal. The Notre Dame area accounts for all the businesses along Notre Dame street.

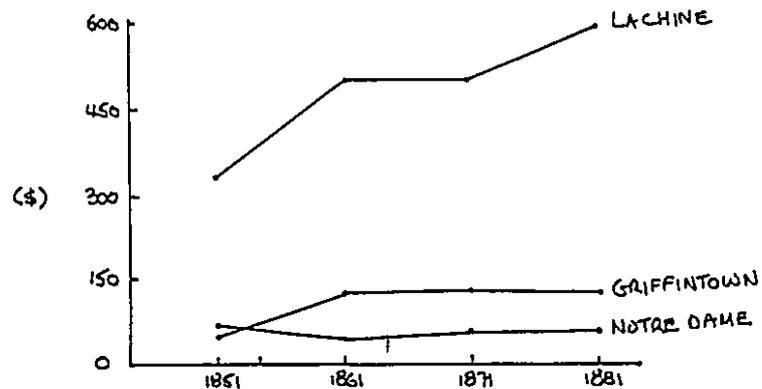
FIGURE 5.16
 SAINT-ANN MANUFACTURING FIRMS BY AREA, 1851-1881



A. Number of firms



B. Percentage of rent



C. Median rent

Source: City of Montreal, Rôle d'évaluation, Saint-Ann ward, 1851-1881

street, the major commercial artery, were a dozen small manufacturing firms catering largely to a retail trade: two bakeries, two saddlers, and four cabinet makers. The western part of the ward along the canal was yet little developed. In the west end lay Cantin's ship yard, while a flour mill, a foundry, and two nail factories were located on Mill street. What is of interest, as it points to future developments, is that these firms were larger and more technologically advanced than other firms in the city.¹⁸⁸

The Canal area over the next five years underwent a massive infusion of capital investment and jobs. From five firms with an aggregate rent of \$3,000 in 1851, the area had twenty-nine firms with an aggregate rent of \$21,960. Its share of the ward's total rent rose from twenty-eight per cent to sixty-four per cent. Firms such as Montreal Rubber (\$800), Ostell's saw mill (\$1,040), Redmond's foundry (\$600), and Redpath Sugar (\$4,000) appeared, and existing firms expanded: rent on Gilbert and Bartley's foundry rose from \$280 to \$1,000, on Gould's Flour mill from \$1,200 to \$3,000, and on Peck's nail factory from \$320 to \$960. As a result, the median rent for establishments along the canal rose to \$500, more than four times the city median. The Canal area, however, was not homogeneous: large flour mills, foundries and nail factories dominated the landscape along Mill street, while at the Saint-Gabriel locks firms were smaller and more diversified.¹⁸⁹ Nonetheless, the establishments along the Lachine canal can be distinguished from those of

¹⁸⁸ McNally, Water Power on the Lachine Canal, pp. 22-23.

¹⁸⁹ For a more detailed description of the factories see McNally, Water Power on the Lachine Canal and Willis, The Process of Hydraulic Industrialization.

Griffintown and Notre Dame by their scale and organization.¹⁹⁰

This dramatic burst of industrialization was not to be repeated. In the twenty-five years following 1856 there was a steady growth in the number of firms and volume of rent, but it was never to equal the development in the previous five years. The Canal area, however, remained the locational core of the city's large-scale and technologically-advanced firms.¹⁹¹ Although its share of the ward's total rent declined to just over half by 1881, the number of firms located there increased, and their scale of operations remained large relative to Saint-Ann and the rest of the city. There was remarkable continuity in the Lachine area during the period. Nearly all the 1856 firms were still there in 1871. While some remained as they had in 1856, others changed hands. The initial development had centred on a few industries, mainly flour milling, metal and woodworking, but by 1871 had diversified: large-scale chemical, textile, leather, and clothing mills dotted the banks of the canal.

Underpinning the large-scale industrial growth in the Lachine area was the construction of a built environment amenable to the new economic order. Central to this was the leasing of hydraulic sites along the canal by the government and the opening of land for development - for industry and for housing - by the Saint-

¹⁹⁰ A few studies have shown that energy-intensive, large-scale firms were the dominant ones on the periphery after 1890. These include E.P. Erickson and W.L. Yancey, "Work and residence in industrial Philadelphia", *Journal of Urban History*, 1979, 5, pp. 147-182; E.E. Pratt, *Industrial Causes of Congestion of Population in New York City* (New York: Columbia University Press, 1911); P. Scranton, "Beyond anecdotes and aggregates: the pattern of industrial decline in Philadelphia textiles, 1916-1931", *Antipode*, 1986, 18, pp. 284-310; G.R. Taylor, *Satellite Cities: a Study of Industrial Suburbs* (New York: D. Appleton and Co., 1915); F.W. Viche, "Black Gold Suburbs: the influence of the extractive industry on the suburbanization of Los Angeles, 1890-1930", *Journal of Urban History*, 1981, 8, pp. 3-26.

¹⁹¹ For a description of Saint-Ann's industry from the 1871 census see Bellavance and Gronoff, "Les structures de l'espace montréalais, pp. 380-381.

Sulpician seminary. In 1844 the government commissioned a plan to lay out hydraulic lots at the Canal Basin close to where the canal emptied into the Saint-Lawrence River. By 1856, twenty sites had been leased, mainly to metal and milling concerns. In 1851 the five lots at Saint-Gabriel locks, further down the canal, were leased as a whole to John Young, a grain and wholesale merchant, and Ira Gould, a miller who through their firm, the St Gabriel Hydraulic Company, "made immense profits by converting what had been intended as a right to use restricted amounts of canal water into a licence to use virtually unlimited quantities". They were shortly joined as partners by John Ostell and Jacob DeWitt. Gould, Ostell and DeWitt were all active in manufacturing along the canal. They subdivided the original five lots into twenty and subleased them to other manufacturers.¹⁹² Peter Redpath, for example, in late 1853 obtained the land for his refinery from both the Seminary and from Ostell, who happened also to be the plant's architect.¹⁹³ Not only were Young and his partners interested in controlling the land around the canal, they also financed the establishment of other manufacturers. In 1853, they extended a £1,000 cash loan to Frederick Harris to help build a three-storey cotton mill at Saint-Gabriel's lock.¹⁹⁴ By 1856 most of the new, large-scale firms of the previous ten years were built at Canal Bank and Saint-Gabriel locks.

¹⁹² Tulchinsky and Young, "John Young", p. 723; McNally, Water Power on the Lachine Canal, pp. 17-48.

¹⁹³ Feltoe, Redpath, p. 39.

¹⁹⁴ G. Tulchinsky, "Frederick Warren Harris" in Dictionary of Canadian Biography, (Toronto: University of Toronto Press, 1976), vol. 9, p. 367.

The success of the leased lots alongside the canal largely depended upon the ability of the government to maintain the quality of the canal's structure and to expand the flow of water into the canal as demand increased. The reports of the Commissioner of Public Works indicate that extensive work was undertaken to keep these two critical features up to scratch. In 1859, for example, John Rose, the Commissioner, wrote that,

such is the increase in machinery, and the use of water, by the mills established on the line of the canal, that it is very much feared, when the river falls again to its ordinary level, there will not be a sufficient supply of water to keep them all going.¹⁹⁵

During 1860 the demand for water increased by twenty-five per cent and Lachine superintendent, John Sippell complained of having difficulty keeping up the water levels.¹⁹⁶ Throughout the period the government was actively finding ways to ensure that the canal's manufacturers had access to adequate water. The state also pumped a great deal of capital into the other components of the canal. Between the Union and 1881 it spent anywhere between \$10,000 and \$35,000 a year on basic repairs. More importantly was the money poured into new construction work such as building new locks, supply weirs and basins, deepening and widening the canal and the basins, and other work. Table 5.9 shows that in the forty-one years following the Union almost \$7.5 million was poured into new construction. This came in waves: during the 1840s, a decade which included the extensive enlargement of the mid-1840s, more

¹⁹⁵ Canada, General Report of Public Works for the Year Ending 31st December, 1859 (Quebec: Thompson and Co., 1860).

¹⁹⁶ General Report of the Commissioners... 31st December, 1860.

TABLE 5.9
CONSTRUCTION EXPENDITURE ON THE LACHINE CANAL, 1840-1889

Years	Total Expenditure (\$)	Annual Mean Expenditure (\$)
1840-1848	1,404,437.58	156,048.55
1849-1856	552,644.83	69,080.60
1857-1873	286,451.02	16,368.63
1873-1883	5,879,886.12	587,988.61
1883-1889	634,978.88	105,829.83
1840-1889	8,758,398.43	175,167.97

Source: "Report of the Commissioners of Public Works" in i) Journals of the Legislative Assembly of the Province of Canada, 1841-1859 and ii) Sessional Papers, 1860-1878/79; "Annual Report of the Minister of Railways and Canals, Sessional Papers, 1878/79-1889/90."

than \$1.4 million went into the canal, for an average of \$156,000. Over the next quarter of a century (1849-1873) there was a lull in construction, little more than \$830,000 being spent on new works over the twenty five years. In the last half of the 1870s and the early 1880s, however, a massive works program was undertaken worth almost \$6 million, for an average of more than half a million dollars a year. By 1883 when the work of enlargement was finished, the canal had been reconstructed in a variety of ways: from the building of new locks, the enlarging and deepening of old as well as building of new basins, to the construction of a new entrance to Montreal's harbour.¹⁹⁷

At the same time as the government was leasing lots along the canal, the seminary, forced by the Ordinance of 1840, was selling off its Saint-Gabriel domain. The seminary's first strategy was to sell subdivisions to manufacturers. Although this was generally unsuccessful, and they eventually turned to housing subdivisions, the sale of seminary land to the Young clique in the early 1850s resulted in the expansion of the hydraulic locks at Saint-Gabriel locks.¹⁹⁸ The industrial development that occurred along the Lachine Canal did not trigger immediate full-scale residential development. The opening-up of the Saint-Gabriel Domain by the Seminary of Montreal for residential construction after 1854 added some housing south of the canal. Between 1854 and 1874, 439 individuals bought lots. Most of

¹⁹⁷ "Report of the Commissioners of Public Works" in the Journals of the Legislative Assembly of the Province of Canada for the years 1841-1859, in Sessional Papers, 1860-1878/1879, and "The Annual Report of the Minister of Railways and Canals" in the Sessional Papers, 1878/1879-1889/1890.

¹⁹⁸ Young, In Its Corporate Capacity, pp. 131-142; McNally, Water Power on the Lachine Canal, p. 39.

them were Irish who worked in the surrounding industrial establishments.¹⁹⁹

Before the breaking-up of the seminary land, Griffintown remained the residential core of the ward's population. In 1850 most of the ward's population of 7,455 resided in wooden shacks east of McCord street. Over the next decade the district's population grew to more than 16,000. To accommodate this growth, twenty-five new streets were added in the ward in the years 1851-1857 alone, and the areas of Point Saint-Charles and the western portion of the ward became settled.²⁰⁰ Sprinkled throughout the fringe of the ward workers built, as a way to keep down costs, 160 illegal houses.²⁰¹ In 1861 only thirteen per cent (341 households) lived south of the canal. Although this had increased to 1,443 households by 1881, most of the population increase occurred during the housing boom of the 1870s.²⁰²

The growth of industry along the Lachine canal during the boom years following the depression of the 1840s was a major break with the past. Firms were large in scale, energy-intensive, incorporating new organizational structures and labour processes, and utilizing modern machinery. They also located in a new part of town. The development along the canal represented a major change from the concentration of industry in the core area. A decisive element in the formation of a

¹⁹⁹ Young, *In Its Corporate Capacity*, pp. 138-141.

²⁰⁰ Conter, "The origins of a working-class district". pp. 4-6.

²⁰¹ Hanna, "Montreal, a city built by small builders", pp. 30-31.

²⁰² Hanna and Remiggi, *Montreal Neighbourhoods*, p. 3; S. Olson, "Partage social and partage de l'espace à Montréal, 1847-1901", *Rapport d'étape*, presented to the Fonds F.C.A.R. (Geography Department, McGill University, 31 Janvier, 1986), pp. 13, 46.

new industrial district was the availability of the Lachine canal's hydraulic power after the mid 1840s. The role of the state and the activity of land developers and manufacturers were also instrumental in making the industrialization of the canal possible. At the same time, rising land prices and the scale of operations of the new firms must have played a role in the manufacturers' decisions. We must not, however, view these decisions outside of the processes at work at the international and national levels. The growing internationalization of the world economy, changes wrought in technologies, the scale of capital investments, and the strategies of Montreal's merchants to overcome the crisis associated with the dismantling of the colonial economy were important factors in the creation of industry along the Lachine canal. Throughout the rest of the century Saint-Ann would remain an important industrial area of Montreal. It would, however, decline in relative importance as new productive relations and new productive spaces such as Saint-Henri and Maisonneuve became ascendant.²⁰³

²⁰³ G. Lauzon and L. Ruellard, 1875/Saint-Henri (Montréal: Société historique de Saint-Henri, 1985); P-A. Linteau, The Promoters' City: Building the Industrial Town of Maisonneuve, 1883-1918 (Toronto: Lorimer, 1985).

CHAPTER 6 INDUSTRY AND SPACE IN MONTREAL, 1871-1918

6.1 A New Industrial Front

Under the National Policy Montreal's manufactures have thrived and increased, attracting a great industrial population and giving employment to thousands of people in their own country.¹

Historically, commercially and financially, Montreal is to-day the metropolis of Canada and one of the most magnificent cities on the American continent.²

Indicative of Montreal's power as the industrial metropolis of Canada by the last decades of the nineteenth century was the factory and generating plant of the Royal Electric Company which heralded the new age of electricity. From a small beginning in 1884, when it employed twelve workers and \$50,000 capital, it had by 1897 developed a plant "equipped with the latest and most modern machinery capable of building the largest electrical machinery in the world, and is now at work manufacturing generators, each of nearly 3,000 horse-power capacity". The energy was generated at the Richelieu Rapids at Chambly, and brought twenty-eight kilometers to Montreal.

The advent of the electric current from Chambly will create new conditions in the city of Montreal. The low price at which electric current can be then supplied will permit its use in many directions not now considered. Its use for illumination will naturally become greatly increased, but the greatest advantages from it will accrue to commercial interests. Motive power will be available at rates which will not only render it profitable for present users of steam power to

¹ Montreal Gazette, July 15, 1890, p. 3.

² Montreal Board of Trade, The Board of Trade Illustrated Edition of Montreal (Montreal: Guertin Printing Company, 1909), p. 1

abandon it, but numerous new industries will be attracted to and established in the commercial metropolis of Canada, where, in addition to the many other advantages, it possesses power that will be inexpensive to the manufacturers as if they were located directly upon some water fall.³

During the convention of the Federated Canadian Mining Institution in February 1897 hundreds of visitors crowded into Royal Electric's works to view the vast array of large and gleaming turbines, generators and other equipment. Electricity was the symbol of the new industrialism and a reflection of the broad front of growth associated with the long wave of the 'Second Industrial Revolution'. As William H. Browne, the company's general manager, told the visitors, "the successful progress of the Royal Electric Company is a component of the increased commercial prosperity of the City of Montreal, and through the use of its manufactures the Dominion will obtain similar advantages".⁴ With such companies, Montreal was in the forefront in the production of electrical equipment and of control of the country's hydro-electric power.

Despite the expansion of the electrical industry, Montreal's growth between 1881 and 1918 was marked by shorter cycles of boom and bust. While the 1880s had been boom years and Montreal's industry had grown rapidly, the 1890s proved to be a decade of depression. The panic of 1893 and the ensuing four years of recession

³ The Canadian Engineer, April 1897, p. 364. In 1901 the various electrical companies in Montreal were merged to form the Montreal Light, Heat and Power Company. Two years later the company signed a contract with the Shawinigan Water and Power Company, which had a large hydro-electricity plant on the Saint-Maurice river, to supply the city with electricity. Thus, in the first few years of the twentieth century the large-scale development of hydro-power in Montreal became reality. A fascinating account of these companies can be found in J.H. Dales, Hydroelectricity and Industrial Development: Quebec, 1898-1940 (Cambridge: Harvard University Press, 1957), chaps. 3-5.

⁴ The Canadian Engineer, March and April, 1897. The quote is from March, p. 338.

led to the massive restructuring of industry. Many firms went bankrupt, firms consolidated, competition intensified, and profit rates fell. In an attempt to counteract these problems many manufacturers sought new technologies, better distribution networks, more secure markets, more stable production conditions, and a vision of a new industrial order. By the late 1890s Canada was emerging from the recession, and the development of the Canadian West, together with the emergence of growth industries such as pulp and paper and aluminium which were related to the benefits promised by hydro power were seen by the state and all fractions of capital as avenues upon which a new Canada could be built. Prosperity reigned for fifteen years except for a recession lasting from the fall of 1907 to the end of 1908. Another recession in 1913 combined with the difficulties associated with the war occasioned, yet again, a reorganization of the Canadian economy.⁵ The broad front of economic expansion that followed the mid-1890s crisis was based on an ideological sense of long-range opportunities and the development of vast new markets hitched to the technical and organizational restructuring of industry. Alongside these changes was a restructuring of Montreal's industry, which had a decisive impact upon the city's productive spaces.

One dimension of Montreal's growth in this period was the creation of new industries and the reorganization of traditional ones. A principal feature of the restructuring was the introduction of new technology. Implementation of faster and

⁵ J. Hamelin and J-P. Montminy, "Québec 1896-1929: une deuxième phase d'industrialisation" in F. Dumont, J. Hamelin, F. Harvey and J-P. Montminy (eds.), Idéologues au Canada français, 1900-1929 (Québec: Les Presses de l'Université Laval, 1973), pp. 15-19; P-A. Linteau, R. Durocher and J-C. Robert, Quebec: a History, 1867-1929 (Toronto: Lorimer, 1985) pp. 308-321.

more sophisticated machines increased greatly throughout the industrial spectrum, contributing to the transformation of sectors and the creation of a new set of structures that firms had to contend with. Between the 1880s and the end of World War I the introduction of new machinery in the metal, glass, tobacco, and chemical industries, among others, changed the way that production was organized, and provided manufacturers with new ways of controlling labour. In the metal and transportation equipment sectors, for example, introduction of more intricate machines together with scientific management undermined traditional artisanal methods that had shaped the industries.⁶ So intense were the changes to the technological basis of industry, especially in the new growth sectors such as electrical appliances, that not to keep up with the changes meant failure. W.H. Browne, the manager of Royal Electric, told the company's shareholders at their annual meeting in 1899 that in the electric industry

inventive genius was so prolific that the plant or apparatus for manufacturing electricity soon became so obsolete. Hence, during the existence of this company, \$1,800,000 of equipment had become useless, or superseded by improved machinery and methods.⁷

Another strategy was more sophisticated management of labour. After the 1880s firms increasingly began to substitute managerial control and direction for the informal methods that had dominated previously. This had a dual effect. First,

⁶ C. Heron, "The crisis of the craftsman: Hamilton's metal workers in the early twentieth century", Labour/Le Travailleur, 1980, 6, pp. 7-48; W. Roberts, "Toronto metal workers and the second industrial revolution, 1889-1914", Labour/Le Travailleur, 1980, 6, pp. 49-72. The metal and transportation sectors will be looked at in some detail in Chapter 6.2 and 6.5.

⁷ The Canadian Engineer, August 1899, p. 112.

machinery was used to direct the labour process to a much greater degree than in the past, and second, as work become more segmented, the workplace increasingly became more bureaucratic.⁸ For example, after a big strike among cigar makers in the summer of 1901 the larger manufacturers introduced the R.J. Williams system into their factories. Through implementing "a specializing and departmentalizing of labor", the intention behind this system was to bring all existing technological innovations within a rationalized and restructured division of labour; to allow for greater productivity through the mixing of hand labour and equipment; and to give greater control to management over each production step.⁹

Many firms were increasing in scale as industries were restructured to meet the new demands of national and international markets. The growing scale was not a new phenomenon for as early as 1881, fifteen per cent of Montreal's firms employed more than seventy per cent of the city's industrial workers, but after the 1890s it took on a new importance.¹⁰

The increased scale and mechanization of firms was associated with the reorganization of the production process. A critical feature of this reorganization was the advent of electric power as the major energy source for industry. By the early

⁸ A.D. Chandler, The Visible Hand: the Managerial Revolution in American Business (Cambridge, Belknap Press, 1977); R. Edwards, Contested Terrain. The Transformation of the Workplace in the Twentieth Century (New York: Basic Books, 1979), pp. 23-36; D. Nelson, Managers and Workers: Origins of the New Factory System in the United States (Madison: University of Wisconsin Press, 1975), pp. 3-11.

⁹ Canadian Cigar and Tobacco Journal, May 1901, pp. 209-210. This system involved systematizing the division of labour between bundling and rolling, alongside the use of wrapper dies, suction tables and a header.

¹⁰ Canada, Census of Canada 1891 (Ottawa: Dawson, 1897), vol. 4, p. 283.

twentieth century the "small steam engine [was] ... seriously threatened" as electric motors were able to provide better quality, better distribution networks, and reduced costs.¹¹ Manufacturers adopted electric motors at the expense of the steam engine to achieve better regulation of speed, savings in power supply, and greater efficiency of floor space. As firms changed from "group" to "unit" drive, they achieved greater flexibility of and a decentralization of the power source.¹² The application of electricity to manufacturing was not an easy matter, and for at least twenty years (the 1880s and 1890s) there were constraints on the wide-spread diffusion of the electric motor to industry. Most pressing was its high cost, solved only with the introduction of centralized power generation.¹³ In Montreal this took the shape of the Montreal Light, Heat and Power Company, formed in 1901. In plants built to accommodate steam engines, the switch to electric power was not urgent nor even advantageous.¹⁴ Large-scale industrial use of electricity in Montreal was initiated in 1898 when Dominion Cotton replaced its old steam equipment with electric power¹⁵, and by 1911 more electric motors than steam engines were being used in the industrial

¹¹ F.M. Kimball, "Small Electric Motors", Canadian Manufacturer, September 15, 1905, p. 33.

¹² Kimball, "Small electric motors", pp. 33-34.

¹³ R.B. Du Boff, "The introduction of electric power in American manufacturing", Economic History Review, 1967, 20, 3, pp. 509-518; Nelson, Managers and Workers, pp. 21-22.

¹⁴ Du Boff, "The introduction of electric power", p. 509; Nelson, Managers and Workers, pp. 21-22.

¹⁵ J.I. Cooper, Montreal, a Brief History (Montreal: McGill and Queen's University Press, 1969), p. 113; Dales, Hydroelectricity, p. 103.

establishments of Quebec as a whole.¹⁶ Meanwhile, a number of electrical apparatus firms were established such as Royal Electric (which became the Northern Electrical and Manufacturing Company Ltd. in 1895) which manufactured telephones, switchboards, fire alarms and other electrical apparatus in its William street factory which had a rent of \$40,000 in 1912, making it one of the largest manufacturing concerns in the city.

The consolidation movement was to have an important impact upon Montreal's industrial landscape. In Canada between 1900 and 1929 there were 505 consolidations involving 1,068 enterprises.¹⁷ A House of Commons Select Committee in 1888 found that there were combinations in the sugar, biscuit, and rope and twine industries.¹⁸ Over the next thirty years the size of an increasing number of the city's firms such as Dominion Textile, Canadian Vickers and Canada Sugar grew. The flagship plants of Dominion Textile - the Hudon and Merchant Manufacturing mills - were located in Montreal. The Dominion Rubber Company (the old Canada Rubber Company) grew from the small company established in 1854 in Montreal's east end, to a trans-Canada one with six other plants spread

¹⁶ Of the 4,203 steam engines in use in Quebec in 1911, more than 3,000 were used by the butter and cheese, and log products industries. Thus, very few urban firms used steam engines. Canada, Census of Canada, 1911 (Ottawa: Parmelee, 1913), vol. 3, pp. 158-163.

¹⁷ J. Smucker, Industrialization in Canada (Scarborough: Prentice-Hall, 1980), Table 7, p. 88.

¹⁸ Canada, "Report of the Select Committee to investigate and report upon alleged combinations in manufactures, trade and insurance in Canada", Journals of the House of Commons, 1888 (Ottawa: Maclean, Rogers and Company, 1888), appendix 3.

throughout Quebec and Ontario.¹⁹ Rationalization of the large firm took many forms. In the case of the Canada Cement Company (1909), the chief objective was to devise a new organizational structure which would "regulate the distribution of the manufactured product."²⁰ However, the ability of large-scale firms to introduce new technology, to control labour, to acquire suitable raw materials, and to regulate distribution could not be taken for granted.²¹

The increasing rationalization of Montreal's industry was fuelled by foreign investment, especially capital from the United States. During the second half of the nineteenth century most capital flowing into Canada was British portfolio capital which went into building railways.²² Now, American firms, through direct investment, were opening manufacturing operations in Canada to get around tariff barriers, to capture lower manufacturing costs, and to "preempt potential rivals in a market adjoining the United States".²³ By 1897 American companies had invested

¹⁹ L. Roberts, From Three Men (np: Dominion Rubber Company, nd).

²⁰ W.R. Houston, Annual Financial Review, November 1909, p. 77.

²¹ M. Gertler, "The limits to flexibility: comments on the Post-Fordist vision of production and its geography", Transactions. Institute of British Geographers, N.S. 1988, 13, pp. 419-432; C. Sabel and J. Zeitlin, "Historical alternatives to mass production: politics, markets and technology in nineteenth-century industrialization", Past and Present, 1985, 108, pp. 133-176; R. Walker, "Technological determinism and determination: industrial growth and location" in M. Castells (ed.), High Technology, Space and Society (Beverly Hills, Sage, 1985), pp. 226-264 and "The geographical organization of production-systems", Environment and Planning D, 1988, 6, pp. 377-408. The difficulties that firms had in introducing technological and organizational changes will be examined in Chapter 6.2 in the context of Montreal's cotton industry.

²² Linteau, Durocher and Robert, Quebec, pp. 336-337.

²³ G.D. Taylor, "Charles F. Sise, Bell Canada, and the Americans: a study of managerial autonomy, 1880-1915", Canadian Historical Association, Historical Papers, 1982, p. 30.

\$35 million (US) into Canadian manufacturing (excluding pulp and paper). Some of the firms established in Montreal by 1897 include the silk manufacturer Belding Paul (1875), Singer Sewing Machines (1883), American Tobacco (1888) and General Electric (1892). By World War I, investment from the United States into Canada's manufacturing had increased greatly, reaching \$100 million (US) dollars, still excluding pulp and paper), and the new firms in Montreal and its environs include United Shoe Machinery (1902), Allis-Chalmers (1904), American Locomotive (1908), and American Can (1908).²⁴

These changes to the economic environment did not develop without a response from labour. Throughout North America a strong heritage of worker resistance deeply affected the contours of capitalist development²⁵; Montreal was no exception.²⁶ This occurred in at least two ways: confrontation at the point of

²⁴ M. Wilkins The Emergence of Multinational Enterprise: American Business Abroad from the Colonial Era to 1914 (Cambridge: Harvard University Press, 1970), Table VII.1, p. 144.

²⁵ J. Bodnar, Immigration and Industrialization (Pittsburgh: University of Pittsburgh Press, 1977); F.G. Couvares, The Remaking of Pittsburgh: Class and Culture in an Industrializing City, 1877-1919 (Albany: The State University of New York Press, 1984); J.T. Cumbler, Working Class Community in Industrial America: Work, Leisure and Struggle in Two Industrial Cities, 1880-1930 (Westport: Greenwood Press, 1979); A. Dawley, Class and Community: the Industrial Revolution in Lynn (Cambridge: Harvard University Press, 1976); D. Montgomery, "Whose standards? Workers and the reorganization of production in the United States, 1900-1920" in D. Montgomery (ed.), Workers' Control in America (Cambridge: Cambridge University Press, 1979), pp. 113-138; and R. Price, "Theories of labour process formation", Journal of Social History, 1984, Fall, pp. 91-110. For Canada see G.S. Kealey, Toronto Workers Respond to Industrial Capitalism, 1867-1892 (Toronto: University of Toronto Press, 1980) and "Work control, the labour process, and nineteenth-century Canadian printers" in C. Heron and R. Storey (eds.), On the Job: Confronting the Labour Process in Canada (Kingston and Montreal: McGill-Queens University Press, 1986), pp. 75-101; B.D. Palmer, A Culture in Conflict: Skilled Workers and Industrial Capitalism in Hamilton, Ontario, 1860-1914 (Kingston and Montreal: McGill-Queens University Press, 1979) and Working-Class Experience. The Rise and Reconstitution of Canadian Labour, 1800-1980 (Toronto: Butterworth, 1983).

²⁶ For a listing of strikes in Montreal in the beginning of the period see J. Hamelin, P. Larocque and J. Rouillard, Répertoire des grèves dans la province de Québec au XIXe siècle (Montréal: Les Presses de l'École des Hautes Etudes Commerciales, 1970). For a discussion of worker resistance in the cotton

production and the development of trade unions. Working-class solidarity developed unevenly due to differences in the structure of workplaces, the ethnic and gender composition of the labour force, and the location of jobs within the city. Workers also had to face employers who, despite their own differences, were united on their opposition to the open shop, the union labour and collective bargaining.²⁷ At the same time, however, common interests arising from conflict with employers and the cyclical nature of the economy solidified and reinforced working-class organizations and communities. In Montreal the result was periods of quiescence punctuated by bursts of strike activity and the different rates of union organization between industries. Between 1875 and 1894 there were eighty-eight recorded strikes in Montreal, while there were 287 listed strikes between 1901 and 1921.²⁸ Strike activity was particularly strong in some industries: the shoe and cotton industries accounted for thirty and twenty-one strikes respectively.²⁹ There were also differences in the issues raised by workers. To take two examples. In 1890 the 100

and shoe industries see J. Ferland, "Syndicalisme 'parcellaire' et syndicalisme 'collectif': une interprétation socio-technique des conflits ouvriers dans deux industries québécoises, 1880-1914", *Labour/Le Travail*, 1987, 19, pp. 49-88 and "In search of the unbound Prometheus: a comparative view of women's activism in two Quebec industries, 1869-1908", *Labour/Le Travail*, 1989, 24, pp. 11-44. For a discussion of unionization after mid century in the metal industry see P. Bischoff, "La formation des traditions de solidarité ouvrière chez les mouleurs montréalais: la longue marche vers le syndicalisme (1859-1881)", *Labour/Le Travail*, 1988, 21, pp. 9-43.

²⁷ For a discussion of this for Montreal see T. Copp, *The Anatomy of Poverty. The Condition of the Working-Class in Montreal, 1897-1929* (Toronto: McClelland and Stewart, 1974), chap. 8 and J. De Bonville, *Jean-Baptiste Gagnepetit. Les travailleurs montréalais à la fin du XIXe siècle* (Montréal: l'Aurore, 1975), chap. 5.

²⁸ Copp, *The Anatomy of Poverty*, chap. 8; De Bonville, *Jean-Baptiste Gagnepetit*, p. 172.

²⁹ Ferland, "Syndicalisme 'parcellaire' et syndicalisme 'collectif'", Appendix.

weavers at the Globe Woollen Mills in the East End

struck because they could not live on what they were receiving. They were paid by piece work, and at the old rate of wages (five cents per yard) they could make \$1.25 per day, but they now allege that last fall they were reduced a half cent per yard, and now another cent has been taken off.³⁰

In the same year there was great deal of discussion about the length of the day. At a meeting that took place under the auspices of the Trades and Labour unions, speakers called for the establishment of the eight-hour day, arguing that it would lead to a reduction of crime, pauperism and drinking; solve unemployment and increase consumption; and allow workers to spend time on self-education.³¹ Lastly, there were great differences in the intensity of strike activity by years. While the first years of the twentieth century were quiet, 1903 was "one of the most conflict-ridden years in the history of Montreal", with long strikes of tramway and electrical workers, longshoremen and building labourers. There were in this period strikes in a number of manufacturing industries such as tobacco, the railway shops, textiles and clothing.³²

³⁰ Within three days the strike was "terminated, the men resuming work on the terms suggested by the employers". They had lost because, in the words of the mill's manager, "[t]he mill would not close" as he "would have little difficulty in supplying the places of the strikers" and he "[a]ready .. had half a dozen applications". Montreal Gazette, March 18, 20, 21, 1890.

³¹ Montreal Gazette, April 28, May 6 and 7, 1890. One speaker went on to quote the "Montreal poet", Jimmy Howley,

I see a glorious coming day,
When toil's true sons must have fair play,
Shorter hours and better pay
By holding well together.

See Montreal Gazette, April 28, 1890.

³² The Anatomy of Poverty, chap. 8. The quote is from p. 130.

The broad front of economic development that swept through Montreal after the depression of the 1890s brought in its wake a new industrial order. While this new order did not involve a transformation of the structural nature of capitalism, it was associated with a change in the way that capital was used. Corporate firms, many of them American, operating new and intricate forms of machinery with new production processes and new forms of labour became an important avenue of manufacturing growth. By the turn of the century a new industrial order - composed of new energy sources, new technologies, changes to the labour process, new organizational structures, and more complex firms - was a central feature of Montreal's economy. Increasingly, firms of large scale, employing large amounts of capital, large numbers of employees, and mass production techniques, came to play a larger part in the functioning of the city's industry. While this was certainly one feature of the city's industrial structure, it was not the only one. Just as important was the diversity in terms of scale and production formats between and within different sectors. From the small-scale forge of the blacksmith who still worked under artisanal conditions to the giant 'satanic mills' of the textile industry in which large numbers of women and children laboured under harsh and authoritarian conditions, the ways in which production was organized were numerous. Structural limits imposed by technological optimums, limits to the construction of a distribution network, the structure of the market, the nature of the product, the ability to control labour and the relationship between industries placed severe constraints upon individual firms.

6.2 Diverse Industries, Scale and Productive Practices

Today Montreal is the centre of the cotton manufacturing of Canada; the great proportion of sugar consumed in Canada is refined here; the largest paint mills are here located. Its mills produce iron and steel bridges, and structural work which finds a market throughout the Dominion. It is the leading centre of the boot and shoe industry. The country's entire white lead industry is to be found here. It is the chief producer of rubber goods, and the production of nails still remains a large and important industry. It has wallpaper, oil cloth, sewing machines, typewriter, telephone, electrical apparatus, glass, jewellery, ready-made clothing, tinware, trunk and many other of the largest industries of Canada.³³

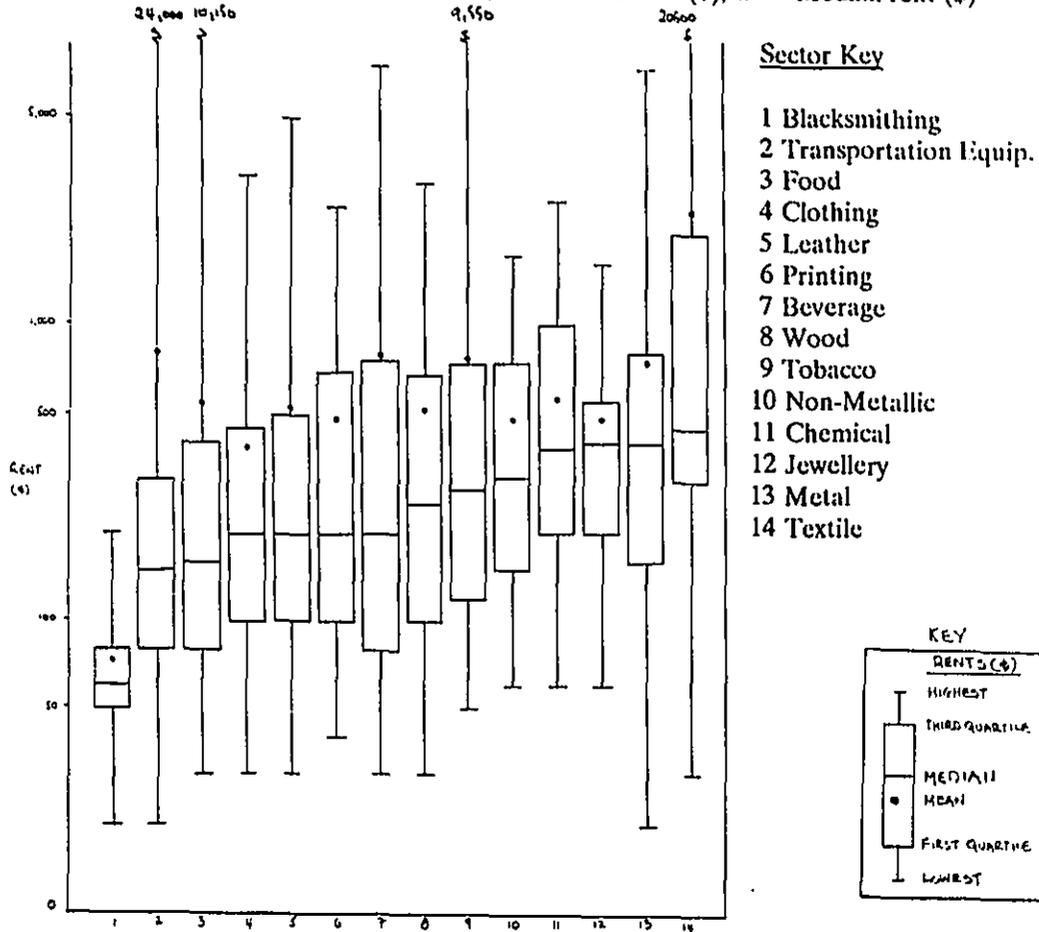
The breadth of Montreal's industrial structure for 1890 is shown in Table 6.1. Still dominant were the labour-intensive, light, consumer industries like clothing, food, wood, leather and printing. These five sectors together accounted for over half of the firms (775 of the city's 1,352 firms, or fifty-seven per cent) and half the rent (\$368,286, or forty-nine per cent). They tended to be small to medium in size, mean rent for a sector running from \$391 for clothing to \$555 for food. This industrial base still rested upon a cheap labour pool: displaced artisans, women, children, unskilled immigrants from the countryside and from Europe. Heavy industries such as primary metal and transportation equipment were important nevertheless. While Montreal did not have the range and size of metal-producing industries as some centres such as Hamilton, it had an impressive set of rolling mills, foundries, nail factories, and machinery makers, and it was the centre of transportation equipment manufacture in Canada. The Grand Trunk Railway shops remained the largest manufacturing establishment in the city (\$24,000 in 1890).

³³ Montreal: The Metropolis (Montreal: Gazette Printing Company, 1909) p. 166.

TABLE 6.1
MANUFACTURING FIRMS BY SECTOR AND RENT, MONTREAL 1890

Sector	A	B	C	D	Sector	A	B	C	D
Clothing	109,999	281	391	200	Jewellery	16,080	33	487	400
Metal	107,134	142	754	400	Rubber	13,700	1	13,700	13,700
Food	88,179	159	555	160	Paper	13,370	13	1,028	700
Wood	66,622	129	516	250	Miscellaneous	12,528	48	261	145
Textile	64,451	29	2,222	450	Non-Metallic	9,850	20	492	315
Transportation	60,031	74	811	150	Blacksmithing	7,033	97	73	60
Leather	56,214	109	516	200	Electrical	6,274	6	1,046	422
Printing	47,272	97	487	200	Petroleum	888	1	888	888
Tobacco	26,170	33	793	280	Unknown	2,660	12	222	175
Beverages	26,110	34	768	200					
Chemical	22,744	34	669	380	City Total	757,309	1,352	560	200

A = Total rent (\$); B = Number of firms; C = Mean rent (\$); D = Median rent (\$)



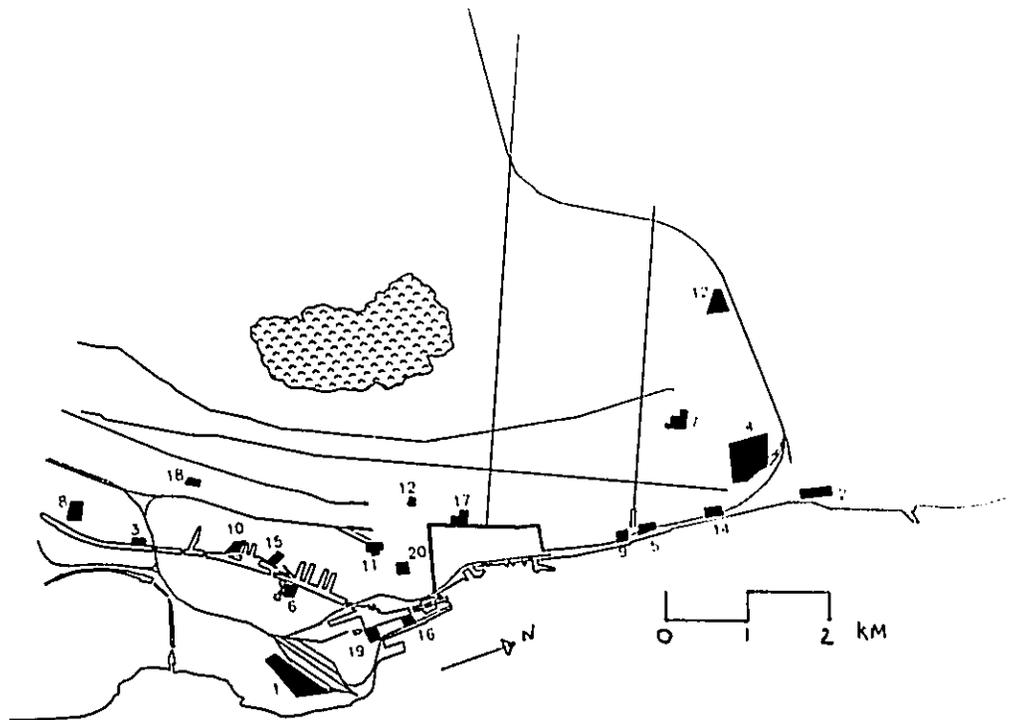
Source: City of Montreal, *Rôle d'évaluation*, 1890.

Despite the impressive growth in firms and total product since 1861, there had been little change to the make-up of manufacturing. As Table 6.1 shows, the dominant sectors are still the same. Clothing, food and metal sectors grew rapidly and still accounted for the largest rent totals and number of firms. Other sectors such as leather grew very slowly. Some sectors continued to grow, such as printing, textiles and chemicals, while others emerged as significant sectors for the first time, such as paper and electrical.

Another element of the growth of industry in Montreal was the diversified nature of the size of firms and industries. Industrial scale ranged from the small blacksmithing shop doing repair work on carriages and boilers and doing contract work for other industrial establishments, to the giant sugar refinery or textile mill along the Lachine canal. The smallest firms (less than \$100) consisted mainly of blacksmith shops, cabinetmakers, job printers, and family bakeries. The next group at the city-wide median (\$200), is well represented among metal finishing, clothing, and boot and shoe establishments. In the middle category, we find the larger clothing, food, metal fabricating and leather firms. The top two categories contain the largest twenty per cent of the firms in 1890: the huge railway shops, the cotton mills, the sugar and flour refineries, the rolling mills and several other metal-working establishments. Figure 6.1 shows the largest twenty firms in Montreal in 1890.

While some firms and industries were able to maintain control over markets and their profits through monopoly techniques and government support, the ability of others was greatly limited by the difficulties associated with the implementation

FIGURE 6.1
 TWENTY LARGEST MANUFACTURING FIRMS IN MONTREAL, 1890



Company	Product	Rent	District
1. Grand Trunk Railway	railway cars	24,000	Lachine
2. Hochelaga Cotton (Hudon)	cotton	20,600	Maisonneuve
3. Merchants Manufacturing	cotton	16,928	St-Henri
4. Canadian Pacific	railway cars	15,000	Ste-Marie
5. Canadian Rubber	rubber wear	13,700	Ste-Marie
6. Canada Sugar Refinery	sugar	10,150	Lachine
7. Macdonald, W.C.	tobacco	9,550	Ste-Marie
8. L'Union des Abattoirs	meat products	9,066	St-Henri
9. Molson, J.H.	brewed drinks	7,270	Ste-Marie
10. Montreal Rolling Mills	iron products	7,194	St-Henri
11. Dow Brewery	brewed drinks	6,680	St-Antoine
12. L'Union des Abattoirs	meat products	6,000	Ste-Marie
13. Ames, Holden	boot and shoes	5,000	St-Antoine
14. Hochelaga Cotton (St-Ann)	cotton	4,800	Ste-Marie
15. Ogilvie (Glenora Mill)	flour	4,720	Lachine
16. Peck, Benny	nails	4,500	Lachine
17. Chanteloup Foundry	brass goods	4,400	Old Montreal
18. Willams Manufacturing	sewing machine	4,170	St-Henri
19. Ogilvie (Royal Mill)	flour	4,000	Lachine
20. Robertson Lead	lead piping	3,850	Griffintown

Source: City of Montreal, Rôle d'évaluation, 1890; Saint-Henri, Rôle d'évaluation, 1890; Sainte-Cunégonde, Rôle d'évaluation, 1890; Côte Saint-Paul, Rôle d'évaluation, 1895.

of new technologies, the transformation of the labour process, and the expansion of markets. Where production required the application of heat, and involved chemical rather than mechanical methods, there was greater potential for mass production techniques.³⁴ At the end of the century a modern chemical industry emerged, characterized by high-volume and continuous processing of complex chemicals; larger plants and capital, more sophisticated machinery, standardized production, hierarchical managerial structures, and laboratories for research and development.³⁵ This was also possible in cigarettes, grain, soap and canning, so that in these industries continuous-process machinery permitted a larger output, a smaller labour force, and a reduction of the skills required. In other industries the possibility for mass production was severely curtailed despite the application of new machinery and new sources of energy. In the clothing, leather and wood industries, for example, the possibility of accelerating the velocity of production was constrained by the nature of the product and the way that the product was transformed.

The result was that there were major differences between and within industries in terms of their organizational structure, and accordingly, their scale. Despite the widespread effects of the burst of economic expansion in the years after the late 1890s, there was no single trajectory of growth among industry. Rather than a dualistic structure of large and small, proprietary and corporate firms, there arose

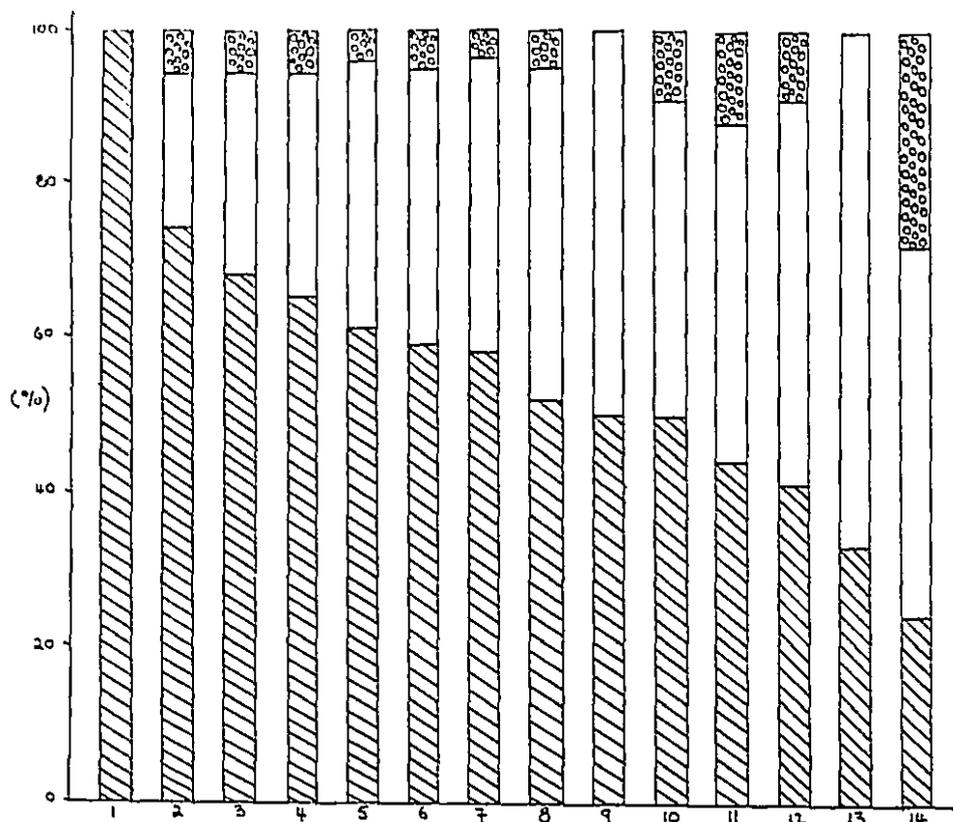
³⁴ Chandler, The Visible Hand, pp. 240-244.

³⁵ D. Dyer and D.B. Sicilia, "From commodity to speciality chemicals: cellulose products and naval stores at the Hercules Powder Company, 1919-1939", Business and Economic History, 2nd Series, 1989, 18, pp. 59-60.

out of the different possible combinations of production a wide variety of productive strategies. Tables 6.1 and Figure 6.2 provide some evidence of these differences. The median rents of sectors ranged from \$300 or more (electrical, textile, metal and chemical) to less than \$175 (food, transportation equipment, and blacksmithing). The mean rents highlight the differences between sectors even more sharply. While there was great variation between sectors, there were also significant differences within them. As we see in Figure 6.2, some sectors, notably textile, metal and chemical, consisted of firms in all categories of sizes, while others, like beverages, had a polarized structures: in this case it reflects a multitude of small aerated water makers and beer bottlers, and a small number of big breweries. In some sectors - food, transportation and blacksmithing - smaller firms predominate. In the food sector, for example, the flour and sugar mills loomed next to the medium size vinegar manufacturer and the small family bakery.

In other words, production formats varied within and between industries. Although independent artisanal production, to a large extent, had disappeared from the industrial scene by the late nineteenth-century, the hold-outs of artisanal production were blacksmithing work, amongst others, and a great many firms in furniture, food, printing, and metal still operated in the context of 'proprietary capitalism'. In the very largest enterprises, like the Hudon Cotton mill and the Angus shops of Canadian Pacific, control was centred in the hands of a managerial hierarchy answerable to stockholders and a board of directors. Between these two extremes were a large number of firms from nearly all manufacturing sectors which

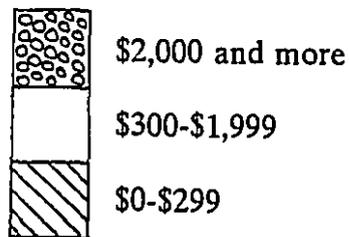
FIGURE 6.2
DISTRIBUTION OF SIZES OF RENTS IN SECTORS BASED
ON THEIR MANUFACTURING RENTS, MONTREAL 1890



Sectors

- | | |
|--------------------------|-----------------|
| 1. Blacksmithing | 8. Wood |
| 2. Transportation Equip. | 9. Non-Metallic |
| 3. Beverage | 10. Tobacco |
| 4. Food | 11. Chemical |
| 5. Leather | 12. Metal |
| 6. Printing | 13. Jewellery |
| 7. Clothing | 14. Textile |

Rent Sizes



Source: City of Montreal, Rôle d'évaluation, 1890

functioned according to some mixture of different productive strategies, which produced several production formats.

Since production formats were differentiated with respect to labour, technology, marketing strategies, and access to financing, I shall, through an examination of three industries, provide illustrations of the different production formats that were open to manufacturers between 1880 and the end of World War I, and draw out the contrasts with the early period. We shall see that the enterprises in each line adopted different and new strategies of integration. Cotton is an example of a highly capitalized industry utilizing continuous-processing methods of production and a large, unskilled workforce. The metal industry, in contrast, exhibits a wide range of productive strategies. Lastly, baking was characterized by differences among the bread-making, confectionery, and biscuit branches.

Cotton and a large-scale, continuous-processing strategy

One of the most important industrial sectors in Montreal at the end of nineteenth century was that of textiles. As Table 6.2 indicates, the city's textile sector consisted of twenty-nine firms ranging from the mammoth Hudon cotton mill of the Hochelaga Manufacturing Company with its rent of \$20,600 to the small stocking, bedding and sail makers with rents under \$100. The most important segment of the textile industry, and the the one that I shall analyse here, was that of cotton manufacture. Although Montreal's first cotton mill opened in 1853, it was not until the 1870s that the foundations of the textile industry were fully laid in the city with

TABLE 6.2
MONTREAL TEXTILE, METAL AND BAKING SECTORS, 1890

		Number of Firms	Total Rent (\$)	Mean Rent (\$)
<u>A. Textile</u>	Cotton	3	42,328	14,109
	Woollen Products	3	6,500	2,167
	Bags and Rope	7	8,733	1,248
	Dyeing	3	1,050	350
	Quilted Goods	4	1,050	262
	Canvas Goods	3	680	227
	Other	6	4,110	685
	Total	29	64,451	2,222
<u>B. Metal</u>	Rolling Mills	4	16,194	4,049
	Edge Tools	5	7,402	1,480
	Foundries	49	48,432	988
	Tin Working	10	6,946	695
	Bolt, Nuts & Dies	8	5,210	651
	Boilers	5	2,620	524
	Agricultural Tools	5	2,400	480
	Wire Working	5	1,810	362
	Safes & Scales	9	2,870	319
	Machine Shops	26	5,880	226
	Other	16	8,370	523
Total	142	107,134	754	
<u>C. Baking</u>	Biscuits & Crackers	13	6,904	531
	Confectionery	48	18,948	395
	Bakeries	63	7,300	116
	Total	124	33,152	267

Source: City of Montreal, Rôle d'évaluation, 1890

the establishment of the Hudon mill in 1873. At the time it was built, the Hudon mill was one of the largest factories in the city and continued to be for the rest of the century.³⁶ The opening of the Hudon mill was followed by the creation of two other large cotton mills in the early 1880s. Merchants Manufacturing and St. Anne's Spinning were established by a number of Montreal's dry goods merchants and bankers to reduce dependence upon British supplies of basic cotton lines. Growth in the cotton industry was further accelerated by "the greater economy in production due to the employment of new and improved machinery", the increased exploitation of labour, and the adoption of the National Policy which imposed a twenty to thirty per cent tariff upon textiles.³⁷ By the early 1880s the capacity of the Canadian cotton mills was far greater than domestic demand, but they could not meet British and American competition in the international market. Even in the national market, Canadian manufacturers could not compete in fancy lines with American and British firms which were "unassailable" because of the latter's access to cheaper labour and fuel, colossal chunks of capital, and their firm control of world markets.³⁸ In 1885 in an attempt to solve the problems of over-capacity and intense competition the two

³⁶ J.D. Borthwick, Montreal, its History to Which is Added Biographical Sketches, with Photographs of Many of its Principal Citizens (Montreal: Drysdale and Company, 1875), p. 143; R.E. Rudin, "Victor Hudon" in Dictionary of Canadian Biography, (Toronto: University of Toronto Press, 1990), vol. 12, pp. 455-457.

³⁷ Canadian Journal of Commerce, October 14, 1887, p. 705; Ferland, "In search of the unbound Prometheus", pp. 24-29. An insight into the effects of the increasing pressure applied to labour can be assessed from the issues leading to strikes. In 1880 the stated reasons why more than 500 women went out on strike at the Hudon cotton mill were "la brutalité de certains contremaîtres et des irrégularités dans le paiement des salaires." See Hamelin et al., Répertoires des grèves, p. 51.

³⁸ Canadian Journal of Commerce, October 14, 1887, p. 705.

Montreal east-end cotton factories of St. Ann Spinning and Hudon Cotton amalgamated to form the Hochelaga Manufacturing Company.³⁹

In the financial crisis of the mid 1880s, manufacturers found that the problems facing the industry were many and that they were difficult to solve.

It is to the multiplication of small mills, the overproduction in certain lines, the expensive and often incomplete system of management, and the senseless competition in values, that the existing conditions of this important industry must be ascribed.⁴⁰

Manufacturers were forced to experiment with running on "short time", a short-term palliative at best, but this was unsuccessful.⁴¹ More successful was the introduction of new machinery (such as the high-speed gravity spindle and the automatic loom), and the intensification of labour (through higher speed of work and allocating more looms to each worker).⁴² In the early 1890s, Andrew Gault, dry goods merchant and David Morrice, a commission agent, cognizant of the early attempts to deal with over-production and price competition engineered two sets of mergers. In 1890 they formed Dominion Cotton Mills from a merger of Hochelaga Manufacturing and six other firms. The logic of the consolidation was pointed out at the shareholders' meeting in December, 1890:

The purpose of the arrangement is to increase profits by diminishing

³⁹ B. Austin, "Managing marketing in a commodities manufacturing firm: Dominion Textile", Business and Economic History, 2nd Series, 18, 1989, pp. 168-177 and Canada, Report of the Royal Commission on the Textile Industry (Ottawa, Patenaude, 1938).

⁴⁰ Canadian Journal of Commerce, January 23, 1891, p. 161.

⁴¹ Canadian Journal of Commerce, August 15, 1890, p. 306.

⁴² Ferland, "In search of the unbound Prometheus", pp. 29-41.

the cost of management and by diversifying production, or rather by limiting each mill to a particular line of goods ... All the mills brought thus under a central management are to be run continuously to their full capacity, a fact of considerable importance in relation to the cost of production, one or two being employed exclusively on goods for the Magog print mill, while others will engage in the manufacture of grey cottons for China.⁴³

By 1891 Dominion was made up of eleven different plants, and the next year, Gault and Morrice together with an American banker and manufacturer, merged seven other firms into the Canadian Coloured Cottons Ltd. with a subscribed capital of \$5 million.⁴⁴ This was an attempt to bring production under centralized control: Dominion would concentrate on bleached, unbleached and printed goods, while Canadian Coloured would specialize in the manufacture of raw stock and yarn-dyed fabrics. The two newly consolidated firms accounted for nineteen of the twenty-six cotton mills in Canada and approximately seventy per cent of the machinery. That experiment identifies the new features of the production format of the cotton industry: a specialized production in each firm and in each mill, with continuous runs of basic lines; control concentrated in the hands of small group of Montreal financiers who played no part in the production of the commodities; and management-labour relations modelled upon the large integrated mills of Lowell.

Problems persisted, despite the making of a strategy emphasising high volume output of basic cotton lines and careful coordination of all the elements in the production line. Thus, in 1905 the textile owners again resorted to consolidation. The

⁴³ Montreal Gazette, December 13, 1890, p. 2.

⁴⁴ Canadian Journal of Commerce, March 4, 1892, p. 406 and March 18, 1892, p. 502.

Dominion Textile Company was made up of four of the largest cotton firms in Canada, including Dominion Cotton, and it accounted for half of the industry's total equipment. The intent of the merger was to reduce costs through rationalization of production facilities and economies in management and purchase of raw materials. Each mill was to be "assigned particular lines ... instead of turning out the same materials, overlapping in their production".⁴⁵ Dominion's strategy was to intensify product simplification through the standardization of lines by plants. Added to this was, like the earlier amalgamations, an attempt to reduce costs through large purchases of raw material⁷ and the reduction of management costs. Finally, the rationalization of production was continued through the closing down of peripheral plants, such as in Windsor, Nova Scotia and Moncton.⁴⁶ Throughout this period the Montreal plants - Merchants, Hochelaga and St Annes - remained the principal plants of Dominion. At the same time, financial control remained in the hands of a select group of stockholders residing in Montreal. The overall strategy was one of mass production with the emphasis upon high-volume production, control over competition, increased pressure on labour, and careful management practices.

Metal and the diversity of productive strategies

Montreal was as successful in metallurgy as it was in textiles. According to one contemporary writing in 1888,

⁴⁵ Canadian Manufacturer, January 6, 1905, p. 28.

⁴⁶ Austin, "Managing marketing"; Canada, Report of the Royal Commission on the Textile Industry, pp. 31-39.

[i]n the department of heavy iron work, the city of Montreal stands unrivalled in the Dominion, and has the best of facilities for manufacturing. The advantages of abundant cheap fuel and excellent transportation facilities by rail and water, both for receiving the raw material and delivering the manufactured article, are used to the fullest extent.⁴⁷

In contrast to the textile sector with its concentration on cottons and mass production, the manufacture of metal products took place in a wide variety of firms within different production formats. Huge rolling mills at the Lachine Canal averaged over \$4,000 in rent, while the small machine shops averaged \$226 (Table 6.2). These differences resulted from the numerous paths open to entrepreneurs as a result of the intricate character of the industry. In Montreal as elsewhere in North America the metal industry was populated by numerous small-scale firms well into the twentieth century despite the transition to new technologies and new energy sources, and the development of corporations after 1890. Indeed, the metal industry was the crucible for many of the technological and organizational changes that were to transform industry and undermine skilled labour's control over production in the first decades of the twentieth century, but the transformation did not occur overnight.⁴⁸ Despite the new ways of organizing production and the introduction of new technologies, many of the ways of production were to be maintained for many years. This is especially true in the foundry where "skilled workers [w]ould not be

⁴⁷ The Commerce of Montreal and its Manufactures (Montreal: Bishop Engraving, 1888), p. 145.

⁴⁸ For Montreal see Bischoff, "La formation des traditions" and W. Kilbourn, The Elements Combined: a History of the Steel Company of Canada (Toronto: Clarke, Irwin, 1960). Detailed discussions of these issues for other parts of North America can be found in Chandler, The Visible Hand, pp. 258-272; Heron, "The crisis of the craftsman"; Roberts, "Toronto metal workers", p. 50.

reduced from artisans to machine tenders" until at least World War I.⁴⁹ In Montreal rolling mills skilled workers tended to have a great degree of autonomy "particularly in the finishing works where each had control of the care and production of his own machine".⁵⁰ In the machine shop, skilled machinists practised their trade on a vast assortment of machinery.⁵¹ While the years after 1890 saw an increasing centralization of capital into a few large-scale corporations such as Stelco and Canadian Car, manufacturers of metal products continued to practice a wide range of productive strategies. According to J. Soltow the metal-working section of the industry was characterized by different forms of small business: those which operated on the fringes of industries dominated by large-scale firms; those serving as a "satellite" to one large concern; and those which occupied a niche and competed through product differentiation. These firms tend to be differentiated from large firms through their access to finance, owners' direct control over production, serving local markets, non-standardized production, and product differentiation.⁵² At the turn of the century, Montreal's metal industry was characterized by a vast assortment of firms, differentiated in terms of scale, technology, labour process and markets.

Table 6.3 shows the production formats of four Montreal metal firms. The

⁴⁹ Roberts, "Toronto metal workers", p. 50.

⁵⁰ Kilbourn, The Elements Combined, p. 24.

⁵¹ Heron, "The crisis of the craftsman", p. 10.

⁵² J.H. Soltow, "Origins of small business and the relationship between large and small firms: metal fabricating and machinery making in New England, 1890-1957" in S.W. Bruchey (ed.), Small Business in American Life (New York: Columbia University Press, 1980), pp. 192-211.

TABLE 6.3
PRODUCTIVE STRATEGIES IN SELECTED METAL FIRMS

	Montreal Rolling Mills	Glasgow Lead Works	Dominion Brass Works	John Cannon Blacksmith	
1871					
Employees	262	28	18	2	
Fixed Capital (\$)	500,000	200,867	21,000	2,850	320
1890					
Employees	625	60	25	3	
Rent (\$)	7,194	3,850	350	40	
Finance	external	internal	internal	internal	
Products	rolled iron	lead pipe	car fittings	diversified	
Capacity	high/fixed	fixed	variable	variable	
Market Extent	Canada	Canada	local	local	

Montreal Rolling Mills utilized large amounts of fixed capital obtained from some of the most powerful merchants, manufacturers, and financiers of the day. In their Sainte-Cunégonde mill, a large labour force produced iron bars and sheets for the Canadian market. Standing in contrast to this path are the "independent" producers - the Glasgow Lead Works of James Robertson, the Dominion Brass Works, and the blacksmith shop of John Cannon, which operated at smaller capacities, with smaller work forces. They aimed at more specialized markets, or, like Cannon, did a variety of repair and contract work for other firms. To illustrate the different strategies that Montreal's metal firms undertook an examination of a number of firms will be provided.

The rolling mills are the best example of the large-scale, technologically developed firms catering to a national market at the turn of the century, and an examination of Pillow and Hersey shows one path taken by metal firms in the nineteenth and early twentieth century. Its origins go back to a small nail workshop opened by John Bigelow in Saint-Lawrence ward in the 1790s. Using "primitive" American nail machinery, Bigelow manufactured cut shingle nails through a combination of hand and machine labour. By 1839 the Bigelow firm, now called the City Nail and Spike Works, had twenty employees operating five nail-cutting machines. He was one of very few producers in Canada, and most nails were still imported from Britain (wrought nails) or the United States (large cut nails). In the early 1850s, attracted by the motive power generated by, and the advantages of being part of the newly forming industrial nucleus at, the Lachine canal, Bigelow moved

his operations to the Canal Basin. The new factory in 1856 had thirty water-powered nail machines, two spike machines, employed sixty (fifty men and ten boys), produced 25,000 tons of nails and spikes annually, and had a rent of \$600.⁵³

About this time a number of nail makers constructed their own rolling mills, notably Mansfield Holland's nail factory on Mill street, the Peck nail factory (1861) and the Montreal Rolling Mills (1863). Introduction of rolling mill technology was a critical step in the substitution of machine power for labour power. As one writer has stated, metal manufacturers in Montreal in this period were intent on using "as much machinery as possible ... to take the place of labor, which was scarce."⁵⁴ The new system of supplying puddled iron cut costs of shipping, cut waiting time for shipments, and gave better control of the quality of iron bars. The greater range of iron allowed diversification of the finishing trades.⁵⁵

While Bigelow did not build his own rolling mill, in 1863 he acquired the Mansfield Holland mill and took on as partners John Pillow and Randolph Hersey who took over the firm at his death in 1868 and renamed it Pillow and Hersey. By 1871, Pillow and Hersey were employing 157 workers and a capital of \$150,000 to

⁵³ Kilbourn, The Elements Combined, pp. 4-10; Celebration Committee of the Grand Trunk Railway, Montreal in 1856 (Montreal: Lovell, 1856), p. 44; Report of the Commissioner of Public Works, Journals of the Legislative Assembly of the Province of Canada, 1856. There is a discrepancy between the number of machines reported by the two latter publications. I have taken the number reported by the Report, which is significantly lower than the other publication.

⁵⁴ W.J.A. Donald, The Canadian Iron and Steel Industry (Boston: Houghton Mifflin, 1915), p. 60. It should be noted that Donald must be referring to skilled labour as low-wage, unskilled workers were plentiful in Montreal.

⁵⁵ J. Willis, The Process of Hydraulic Industrialization on the Lachine Canal: Origins, Rise and Fall (Ottawa: Environment Canada, 1987), pp. 368-369.

produce goods valued at \$225,000.⁵⁶ With the expanding market and increased competition, they found it necessary in 1872 to build a second rolling mill on Saint-Patrick street, a few blocks along the canal from their first plant. By 1881 the company was paying rent of \$1,600 on the Mill street property and \$1,840 on the new plant on Saint-Patrick street. They specialized in the supply of hardware, in particular nails and spikes, for the construction and railway trades, as well as carriage and farm machinery bolts, furniture tacks and glaziers' points.⁵⁷ Rationalization was introduced in the form of specialization by plant: Mill street concentrated on the manufacture of nuts, bolts and tacks, while at the Saint-Patrick plant the company produced horse shoes, nails and spikes. Further specialization took place with the opening of an office and warehouse on Saint-Peter street in the heart of Old Montreal, close to the financial district. Growth in the 1880s was slow, but, as one writer claimed, in 1886, Pillow and Hersey was the "largest and most prominent in this special line of manufacture in British North America."⁵⁸

The depression of the 1890s hit the Canadian iron and steel industry very hard. As railway construction slowed down, rural Canadians continued to move to the United States, immigration to Canada fell, and foreign competition intensified. By the late 1890s, Pillow and Hersey's iron and steel products were selling at fifty-eight per cent lower than in 1873. To cope with the situation firms were

⁵⁶ Canada, Manuscript Census, Industrial schedules, 1871.

⁵⁷ Kilbourn, The Elements Combined, p. 14.

⁵⁸ Industries of Canada: City of Montreal (Montreal: Gazette Printing, 1886), p. 108.

restructuring.⁵⁹ One strategy, common to many industries, was to form a manufacturers' association in order to control prices. By 1893 an association in which Hersey was a prime mover gained satisfactory control of the industry. For ten years it was able to keep prices artificially high by ensuring that recalcitrant members were kept in line by fines, special forms of competition, and pooling agreements.⁶⁰ Pillow and Hersey also modified and updated their machinery in the 1890s.⁶¹ By 1900 Pillow and Hersey had machines making 2,000 lbs of two and a half inch nails in ten hours, four times what the machines of the 1880s were able to produce. These machines had the effect of de-skilling labour and reducing labour costs since a single operator and two helpers could run ten machines. Pillow and Hersey were at the forefront of technological innovation; G.P. Clapp, the firm's superintendent, was one of the major inventors of changes to the machines.⁶²

The long-term problems of the nail and rolling mill trades, however, could not be solved by controlling prices, the pooling of markets, technological change and rationalization of production. In the 1890s, Pillow and Hersey attempted, unsuccessfully, to sell the company to their major competitor, and in 1902 they were

⁵⁹ Kilbourn, The Elements Combined, pp. 16-17; Donald, The Canadian Iron and Steel Industry, pp. 120, 245-249.

⁶⁰ Donald, The Canadian Iron and Steel Industry, pp. 245-249.

⁶¹ Pillow and Hersey had always been a technological leader. In 1875 Pillow and Hersey built the first wire nail machine in North America. By the mid 1880s, after a decade of jockeying for supremacy, wire nails became the dominant product. One reason for the success of the wire nail was the many changes made to the machinery.

⁶² The Canadian Engineer, July 1900, pp. 54-55.

successful, selling the firm to Montreal Rolling Mills in exchange for \$500,000 worth of stock.⁶³ Three years after the sale, the mill had three trains of rolls (nine, twelve, and eighteen inch) and ninety-six cut-nail machines producing 25,000 gross tons of bar iron and steel, 100,000 kegs of cut nails, 80,000 kegs of railway and pressed spikes, and 5,000 tons of bolts, nuts and tacks.⁶⁴ In 1910 the mills merged with other Canadian iron and steel firms to form the Steel Company of Canada. From the small workshop operated by John Bigelow in the 1790s, the company that was to become Pillow and Hersey in the 1860s was at the end of the first decade of the twentieth century part of a much larger corporate entity that had spread its tentacles throughout Canada.

The creation of large corporate giants such Dominion Textile and Stelco did not do away with either competition nor other smaller firms. While price competition was greatly reduced, the larger firms sought large market shares through such devices as advertising, rights to foreign patents, more efficient distribution networks and 'cost-efficiencies' at the point of production. At the same time, another path was through the accumulation of savings and prior experience in other firms which then were invested into the creation of small and medium firm. The differences resulted from the numerous paths open to entrepreneurs because of the intricate character of metal manufacture, which in turn were associated with the uneven development of technology, the different character of the labour process, and the extent and

⁶³ Kilbourn, The Elements Combined, p. 17. Montreal Rolling Mills also acquired the Hodgson Iron and Tube Company in the same year.

⁶⁴ Canadian Manufacturer, January 6, 1905, p. 21.

nature of markets. Small metal firms were often internally financed, but in this period they turned increasingly to joint-stock companies. They often operated in tandem with, but sometimes in completely different spheres from, the corporations. They could serve large firms, in a formal contracting situation or informally by picking up market slack in times of expansion. They could also attend to markets that were too small or too unprofitable for the mass-production and continuous-flow methods of large corporations. An identifying feature of the smaller firms was their proprietary character. The flexibility of firms operated and owned by 'practical men' with years of experience and geared to the production of a one line for a particular market was a critical ingredient of success in the metal industry. These firms, most often serving a regional market, catered to the demands of firms in other industries as well as those in the metal industry.

One of the most flexible forms was the blacksmithing shop. Blacksmiths utilized few pieces of machinery, the forge still being the common piece of equipment. The blacksmith's shop was small in size: Montreal's ninety-seven blacksmithing establishments had an average rent of \$73, well below the city average, and employed fewer than three workers per shop. Work changed from day to day, as they performed simple repair jobs or contracted out to forge the metal railings for carriages and general ornamental work. They were threatened by the fact that many of the large establishments were constructing their own blacksmith shops.

Between the blacksmith shop at one end of the spectrum and the rolling mills at the other was a great array of firms. Most individuals in the metal, or any other,

industry in late-nineteenth-century Montreal, did not possess large amounts of capital nor did they have access to leading members of the bourgeoisie and their financial support. Some were able to start 'in a small way' and build themselves a substantial fortune. In 1857, at the age of twenty-six, Robertson came to Montreal to establish a warehouse and retail branch of the Scottish lead pipe firm, Alexander, Ferguson and Lonnie. A year later, he went into partnership with William Brown. Success came quickly. After five years he was able to buy the firm out with the £4,000 (\$16,000) he had saved, and he continued as a dealer in plumbers' supplies. At the back of the warehouse on Queen street in Saint-Ann ward he promptly built a small foundry for the manufacture of lead pipe, and employed twelve workers and steam-driven machinery. In 1869 he extended his product line by adding the manufacture of saws of all kinds; in 1871 he employed almost fifty workers who produced lead piping and saws to the value of \$156,000. By the 1870s, competition from local and foreign firms forced Robertson to add new lines such as lead traps and electric wire coverings, and open other factories and warehouses in Toronto and Baltimore. Over time, he brought in his four sons who retained control after his death, and turned the firm into a joint-stock company. Robertson's success resulted not only from his business acumen, and his ability to capture an expanding market, but also from his control of a specialized product line.⁶⁵

Most entrepreneurs had to settle for a more moderate sustenance. Even if

⁶⁵ The Canadian Engineer, January 1901, p. 187; P. Bischoff and Robert Tremblay, "James Robertson" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1990), vol. 12, pp. 900-901.

they possessed financial or manufacturing wizardry there were a number of structural features which militated against great expansion: the relatively small size of the market, the great distances involved in the receiving and shipping of goods, the difficulty of technological change, and competition from Britain and the United States to name a few. Thus while it appears that the National Policy made possible the rapid expansion of industry, there were a series of barriers that limited the growth of individual firms. The tariffs associated with the National Policy were as responsible for the creation of small firms in new industries as they were for the development of large-scale corporations.⁶⁶

The railways gave strong impetus to the development of the local metal industry. The demand for switches, frogs, springs, axles, fittings and general castings provided an avenue for individual entrepreneurs to achieve a reasonable competency. The one hundred and fifty employees of B.J. Coghlin's foundry in the east end produced springs and axles for railway cars while the Vulcan Iron Works on the other side of town, with twenty-four employees in 1888 manufactured frogs, switches and diamond crossings for the Canadian railways.⁶⁷ Dominion Metal, established in 1838 by Charles Garth as a coppersmithing firm, working on plumbing, braziers

⁶⁶ It should be noted that other factors were responsible for the development of smaller firms. Philip Scranton in Proprietary Capitalism: the Textile Manufacture at Philadelphia, 1800-1885 (New York: Cambridge University Press, 1983) found that many of the Philadelphia textile manufacturers left business as soon as they acquired a "competency". Whether this is true for Montreal is not the concern of this thesis, but it does add another, albeit a difficult to document, dimension to industrial organizational structure.

⁶⁷ Special Number of the Dominion Illustrated Devoted to Montreal, the Commercial Metropolis of Canada (Montreal: Sabiston Lithographic and Publishing Company, 1891), p. 73; Industries of Canada, p. 114; The Commerce of Montreal, p. 145.

and baths. In its first years, the firm grew slowly. By 1856 it employed forty men and twelve boys and annually produced output valued at between \$60,000 and \$120,000. With the opening of the Grand Trunk Railway shops in the 1856, Garth anticipated expansion to "tenfold its present importance".⁶⁸ And the firm did grow. This was partly due to the skill and expertise of his sons, who through experience in other firms and by capturing a large share of the brass work for the railways, were able to expand the original foundry and build a new one in the 1880s. In 1863, Charles' son, Henry at the age of twenty-three started worked at the Toronto firm of Carpenter and Company, hardware merchants. He stayed there for five years when he joined the family firm under the control of his brother Charles. In 1875 he became a partner and took over control of the company with his nephew John three years later.⁶⁹ By 1890, the Garths were paying a rent of \$1,600 at the original foundry at the corner of Craig and St Lawrence streets, while for the smaller one in the east end it was \$800. Other firms were able to build a viable business through specializing in products for the railway trade.

Other sectors stimulated the metal industry. Dominion Brass Works, established in 1860 was located in the heart of the metal industry district of Montreal - Griffintown - in a three-storey building. Its speciality was steamship work, but, to insure that it would not become too dependent on the ship trade, it also manufactured brass products, copper work and fittings for plumbers and gas smiths

⁶⁸ Celebration Committee, Montreal in 1856, p. 45.

⁶⁹ Canadian Architect and Builder, January 1897, p. 21; Special Number of the Dominion, p. 45.

in its foundry. George Bush's Eagle Foundry manufactured nearly all of the engines for the area's steamships.⁷⁰

Diversity was a sound strategy given the small size of the market and this, as in the case of the founders H.R. Ives and Company, "obliges them to keep a large variety of manufactures ... instead of confining themselves to a few articles."⁷¹ Ives started off in 1859, producing small hardware, but ran into difficulties because the "struggle to find a market ... was hard and prolonged". Accordingly, in 1868 "business operations were entered upon a more extensive scale by the manufacture of stoves". Twelve years later the firm added the manufacture of barbed wire to their product lines.⁷² Ives' strategy was to maintain a great assortment of products to furnish the uneven and fluctuating demand that resulted from a market small in scale. This did not mean that there was no rationalization of production: as one of the largest metal firms in the city, he was able to split production into two workshops. At Griffintown was located a general foundry, as well as pattern, machine and finishing shops where the firm made bedsteads, railings and crestings. In the foundry three heavy cranes and an elevator facilitated the work of the 200 workers. Ives opened in 1881 a plant producing hardware and stoves on the South Shore at Longueuil. Large orders, such

⁷⁰ For the Dominion Brass Works see Commerce of Montreal, p. 117. For Brush see Celebration Committee, Montreal in 1856, p. 47. By the 1890s Brush had expanded into other lines such as mill and mining engines.

⁷¹ Canada Railway Advertising Co., Montreal Business Sketches With a Description of the City of Montreal, Its Public Buildings and Places of Interest (Montreal: M. Longmoore and Co., 1864), pp. 37.

⁷² A.J. Bray, Canada Under the National Policy: Arts and Manufactures, 1883 (Montreal: The Industrial Publishing Company, 1883), p. 126.

as the 1,000 tons of heavy castings made by Ives for the newly built St. Lawrence Sugar Company in Montreal's east end, would certainly have helped the city's foundries produce some rationalization into their plants, but the fact remains that demand was fluctuating and uncertain.⁷³ They were only able to do this as they were one of the largest metal firms in the city.

Baking: mechanized and artisanal productive strategies

Baking exhibited quite different productive strategies from metal and cotton. In 1890 the 124 baking establishments had a mean rent of \$267 and a median rent of \$120 (Table 6.2). Even within this set there were differences, as we shall see from a number of examples. The industry can be divided into three distinct branches: bread-making, confectionery and biscuits. Of the 124 firms, sixty-three were bakeries, most of them very small, with a retail shop fronting the street and the bakery in the rear. They employed on average seven workers and paid a rent of \$116, about the equivalent of the owner's upstairs dwelling.⁷⁴ Even the largest in 1890 paid a rent of only \$300. Among the obstacles to the development of large, mechanized bakeries was the perishability of the goods, which limited the geographical range of the market. There were technical problems with "hot spots", continuous processing, and

⁷³ The Commerce of Montreal, pp. 44-45; Industries of Canada, p. 105.

⁷⁴ The employee figures are from Canada, Manuscript Census, Population schedules, 1891, reels T-6405 to T-6410.

the quality of raw materials.⁷⁵ By the end of the century the making of bread had not changed from what Martel found in 1871. "La plupart des entreprises ... sont de petites entreprises ayant peu de travailleurs, un stock de capital minime et un énergie manuelle. Nous pouvons les qualifier d'artisanales".⁷⁶

To achieve a large scale, bakers had to integrate horizontally, usually into confectionery. This was the strategy of James Aird, who in 1888 was employing thirty-five workers in the baking of thirty-five types of bread as well as candies and cakes in a two-storey building, fifty feet by fifty feet. The bakery had three brick ovens and one "continuous oven". Even a large establishment such as Aird's with a rent of \$700 in 1890 did not do business with the trade but directly served 1,500 families and catered to off-street clients.⁷⁷ Comparable in its trajectory was the bakery and confectionery of James Griffin founded in 1857 in a "small way" in St-Lawrence district. By the late 1880s, he was manufacturing in a three-storey plant, twenty-four feet by sixty-five feet with a rent of \$800. The store was located on the ground floor, while baking was undertaken in the basement, and the manufacture of candies and confectionery took place on the second floor.⁷⁸

Firms principally involved in confectionery were larger, more mechanized than

⁷⁵ I. McKay, "Capital and labour in the Halifax baking and confectionery industry during the last half of the nineteenth century", *Labour/Le Travailleur*, 1978, 3, pp. 50-57.

⁷⁶ E. Martel, "L'industrie à Montréal en 1871" (M.A. thesis, Université du Québec à Montréal, 1976), p. 33.

⁷⁷ *The Commerce of Montreal*, p. 127.

⁷⁸ *The Commerce of Montreal*, p. 57.

bread baking, but still severely restricted by the size of their markets. As J. Othick points out, one segment of the confectionery industry, cocoa and chocolate, was ready for mass production long before there was a mass market.⁷⁹ The larger establishments were utilizing more space for a sideline in catering. Hall and Scott, for example, "leading caterers and confectioners of the city", supplied confectionery, cakes and pastries for parties and entertainments. Their four-storey premises on Saint-Catherine Street, for which they paid a rent of \$1,500, consisted of a bakery in the basement with the other floors being used for a store, showrooms, and banquet hall. Only one floor of the building was actually used for manufacturing, with the rest being used for distribution.⁸⁰

The manufacture of crackers and biscuits took place in decidedly larger and more mechanized firms. While bread making was an occupation "which demands a great amount of muscle and nimbleness" and where there was "very little machine work ... [c]racker making is a more mechanical and less free-hand process."⁸¹ As early as the mid-nineteenth century, the biscuit industry was using machinery, subdividing the labour process, and utilizing nation-wide distribution networks. By the end of the century, it had achieved a significant degree of vertical integration, had turned to finance capital to underwrite expansion and was serving international

⁷⁹ J. Othick, "The cocoa and chocolate industry in the nineteenth century" in D. Oddy and D. Miller (eds.), The Making of the British Diet (London: Croom Helm, 1976), p. 79.

⁸⁰ Industries of Canada, p. 147.

⁸¹ "Bread-Making", Canadian Journal of Commerce, October 23, 1885, pp. 816-817.

markets.⁸² In the mid 1880s crackers were made on an assembly line where, even before the crackers reached the oven, machines and other equipment mixed, thinned, lengthened, dusted, and stamped the dough.⁸³ Walter Paul, a Montreal grocer, told the 1888 Parliamentary Select Committee on Alleged Combinations that among the biscuit manufacturers, "machinery has been perfected so that they can turn out enormous proportions to what they used to".⁸⁴ One such firm was Viau and Frère which, with a rent of \$2,040 and 200 employees, was the city's largest biscuit and baking establishment in 1890. Its four-storey building on Notre Dame street in Saint-Jacques ward manufactured biscuits, confectionery and self-raising flour. The company employed a forty horsepower steam engine and patented machinery "les plus perfectionnées". It possessed a 700 acre farm on the eastern limits of the city, where thirty cows furnished milk daily for the company's biscuits.⁸⁵ On the other side of town, the Lang Manufacturing Company with 100 employees and a rent of \$1,300 manufactured plain and fancy biscuits in a building 140 by 63 feet. These biscuits were sent throughout Eastern Canada.⁸⁶ A smaller establishment was A. Truteau's factory on Dorchester street in Saint-Jacques ward. With a rent of \$460

⁸² McKay, "Capital and labour"; T.A.B. Chorley, "Nutrition, technology and the growth of the British biscuit industry, 1820-1900" in Oddy and Miller, The Making of the Modern British Diet, pp. 13-25.

⁸³ For a detailed description of the making of crackers see "Bread-Making", Canadian Journal of Commerce, 1885, p. 817.

⁸⁴ Canada, "Report of the Select Committee to investigate and report upon alleged combinations", p. 132.

⁸⁵ K.G.C. Huttemeyer, Les intérêts commerciaux de Montréal et Québec et leurs manufactures - 1889 (Montréal: Imprimerie de la Gazette, 1889), p. 126.

⁸⁶ Industries of Canada, p. 172.

and fourteen employees he still employed "des machines brevetées", and was able to expand its production in good times to a national market. The company was also concerned with the flow of goods through the plant: "[l]e local occupé est vaste et commode et disposé de manière à faciliter toutes les opérations de manufacture et de commerce que cette maison dirige". Like Viau, Truteau attributed his success partly to the fact that he owned a farm from which he obtained high-quality raw materials.⁸⁷

6.3 Industrial Spaces, 1871-1918

At your feet spreads out the city proper - with its wilderness of spires, domes and towering structures, its miles of wide tree-adorned streets, its wonderful harbour, and its numerous outlying towns or suburbs, that form one harmonic whole.⁸⁸

In these modern days there is a marked tendency to specialities in all general branches of manufacture, and by thus confining the efforts to one special branch, better work can be done and cheaper than when the operations are extended over a larger field.⁸⁹

Specialization of workers in the workplace and specialized roles for individual plants required specialization and subdivision of productive spaces, to achieve efficiency in the organization of space. While Montreal may not have been "one harmonic whole" there was a distinct specialization by space and within industry: the division of labour and of industrial structure was translated into a spatial division of

⁸⁷ Huttemeyer, Les intérêts commerciaux, pp. 139-140.

⁸⁸ Montreal Board of Trade, The Board of Trade Illustrated Edition, p. 1.

⁸⁹ Commerce of Montreal, p. 122.

labour. Differences in types of industry, their sizes and their modes of operation generated an even more segmented industrial landscape, and this meant ultimately that the physical infrastructure of the city would be remodelled.

Electricity and spatial divisions of labour

A dramatic example of this process was the introduction of electric power. It permitted internal reorganization of a factory, since unit-drive electric motors facilitated a horizontal plant layout and more efficient flows of materials, and allowed for the expansion of and greater mobility within the built-up area of the city; it allowed for a rearrangement of Montreal's spatial division of labour. But these changes could be achieved only by electrification of the entire city. The production of electricity is an example of the integrative processes underway and their spatial impact, and we will look at three aspects: supply of electric power, the tramways, and electricity and industry.

The supply of electrical current to the city dates from 1884 with the establishment of the Royal Electric Company. Throughout the 1880s and 1890s Royal Electric obtained a number of contracts from the city, and it electrified a large part of the city - it extended its range of arc street lighting, and introduced arc lighting into commercial establishments and incandescent lighting into homes⁹⁰ - and by 1904 was servicing an area which stretched fourteen miles along the waterfront and

⁹⁰ Dales, *Hydroelectricity*, p. 102. C. Hogue, A. Bolduc and D. Larouche, *Québec. Un siècle d'électricité* (Montréal: Libre Expression, 1979), chap. 2.

three to four miles inland.⁹¹

In addition to street, commercial and domestic lighting, the application of electricity to the urban communication network was critical to the development of new productive spaces. The incorporation of the Bell Telephone Company of Canada in 1880 heralded a new age of intra-urban communications. Having a monopoly almost from the beginning, it grew dramatically⁹² - within eight months of incorporation it had acquired telephone licenses, plants and goodwill of several Canadian and United States companies and in 1882 it boasted that it had "purchased all other existing Telephone interests in Canada".⁹³ While the telephone and electric power companies led to a rewiring of the city, they also were responsible for the reorganization of productive spaces: the power company became an important source of electric power for the electric streetcar and for industry, while the diffusion of the telephone led to the possibility for the separation of the head office from the factory

⁹¹ Another indication of the growing scale of Royal Electric is that in 1890 there were 1,287 arc lamps connected to the company's circuits; this had increased to 1,666 by 1895 while five years later it had reached 1,859. The load carried by the company's arc and incandescent lamps increased fifty-nine times. See The Canadian Engineer, January 1904, pp. 27-30. In the early part of the period the electrical industry in Montreal was extremely competitive. Many other electrical companies - such as J.I. Craig's Phoenix Co. which secured the contracts for lighting the suburbs of Saint-Henri, Sainte-Cunégonde and Côte Saint-Antoine in the late 1880s - were attempting to grab a piece of the region's electrical market, although by the beginning of the twentieth century the Montreal, Light, Heat and Power had gained monopoly control. See Hogue, et al., Québec, chap. 3.

⁹² Between 1885 and 1918 the company's assets rose from \$1,635,111 to more than \$50 million, while the number of subscribers increased from 9,614 to more than 300,000. See Bell Telephone Company of Canada, Annual Report, 1885 and 1918.

⁹³ Bell Telephone, Annual Report, 1880 and 1881.

and the instantaneous linking of the different parts of the city.⁹⁴ The purpose of the lines in this period was to facilitate business; very few residences had telephones (in 1915 less than four per cent), which, as Bell saw it, were meant to link business men to their offices.⁹⁵

Another important effect of electrical innovation was the electrification of the city transit network. The Montreal Street Railway Company which had been providing horsecar services since 1861 initiated the electrification of its system in 1892. From thirteen miles of electric track at the end of 1892 the system expanded to eighty in 1895, two hundred and ten in 1907 and two hundred and sixty-two in 1918.⁹⁶ This expansion paralleled events elsewhere in North America and was possible for a number of technical reasons. The trolley permitted the expansion of the capacity to carry passengers; it doubled the speed of the streetcar and thus at a single stroke quadrupled the area that the intra-urban transportation network could reach; and it could ascend moderate grades more easily, all of which enabled the

⁹⁴ For example, as early as 1881 Bell had laid a line from Montreal to Lachine for the use of the manufacturers on the Lachine Canal. See Bell Telephone, Annual Report, 1881. The use of the telephone grew slowly over this period. By 1915 there were only 51,201 stations in the city, more than half of which were connected to businesses. See M. Martin, "Communication and social forms: the development of the telephone, 1876-1920", Antipode, 1991, 23, pp. 309-311.

⁹⁵ Bell's development of a telephone system in these years was based on provision of services for business and the bourgeois areas. While telephone lines crossed working-class districts, only a few, and expensive to use, public telephones were built for the working class. Martin, "Communication and social form".

⁹⁶ R.M. Binns, Montreal's Electric Streetcars. An Illustrated History of the Tramway Era: 1892 to 1959 (Montreal: Railfare, 1973), p. 98. The Montreal Street Railway Company relied on its electric power from both its own supplies (in 1894 it operated two steam plants with aggregate capacity of between 3,500 and 4,000 horse power) and by contracting out to Royal Electric and other companies. By 1910 it supplied itself with 15,000 horse power and purchased 13,000 from other companies. See Dales, Hydroelectricity, p. 103.

streetcar companies to provide more frequent, comfortable, and cheaper service.⁹⁷ In Montreal the extremely low wages that prevailed reduced the ability of the masses to use public transit.⁹⁸ Even after the introduction of special "workingman" tickets in 1892 the trolley was still inaccessible to the majority of workers.⁹⁹

The rapid expansion of the trolley lines radiating out from the city core to the distant periphery initiated a fundamental restructuring of urban space: they expanded the frontiers of the city by integrating adjacent suburban and rural areas into the central city; they made possible the growth of commercial and industrial activities on the fringe; they were partly responsible for a boom in construction activity, as well as raising land values throughout the city, especially parallel to the trolley lines; they reinforced and accentuated existing patterns of residential segregation; and they increased the separation of place of work and place of residence through the lengthening of the journey to work.¹⁰⁰ As I noted above the possibility of a large number of workers having access to the trolley in Montreal was probably quite low. Another reason for this lay in the fact that many workers who lived on the periphery

⁹⁷ J.P. McKay, Tramways and Trolleys: the Rise of Urban Mass Transit in Europe (Princeton: Princeton University Press, 1976); P.O. Muller, Contemporary Suburban America (Englewood Cliffs: Prentice-Hall, 1981), pp. 30-38.

⁹⁸ Comments throughout the nineteenth century from various sources and the evidence presented by Copp, The Anatomy of Poverty, p. 31 for the first decades of the twentieth century indicate that low wages were a major feature of Montreal's labour market.

⁹⁹ D. Cross, "The neglected majority", p. 261.

¹⁰⁰ K.T. Jackson, Crabgrass Frontier: the Suburbanization of the United States (New York: Oxford University Press, 1985); P-A. Linteau, "Canadian suburbanization in a North American context: does the border make a difference?", Journal of Urban History, 1987, 13, pp. 252-274; Muller, Contemporary Suburban America, pp. 30-38; S.B. Warner, Streetcar Suburbs: the Process of Growth in Boston, 1870-1900 (Cambridge: Harvard University Press, 1878).

were already close to their place of work. In Maisonneuve, for example, it appears that a large part of the industrial workforce lived close and walked to the factories.¹⁰¹ The trolley was not used for freight transportation until well into the twentieth century. As late as 1907 the question of whether to allow the street railway company the right to move commercial goods throughout the city was being debated.¹⁰²

Alongside the electrification of the streetcar system was the introduction of electricity into manufacturing. Although electric lighting was installed in several commercial and manufacturing establishments from an early date - the Grand Trunk shops in 1880, the North Shore Railway Co. in 1881 and the Bank of Montreal in 1882 - the first major industrial user of electricity for powering machinery was the Dominion Cotton Mills which in 1898 decided to replace its antiquated steam power system with electric power. Dominion Cotton contracted out to the Montreal Light, Heat and Power Company and its twenty-seven electric motors were driven by 3,412 horsepower.¹⁰³ The decision to introduce electric power had several advantages for

¹⁰¹ P-A. Linteau, The Promoters' City: Building the Industrial Town of Maisonneuve, 1883-1918 (Toronto: Lorimer, 1985), chap. 6. Evidence from cities such as Steelton, Pittsburgh, Philadelphia and Detroit shows that a large segment of the working class, both native and immigrant, lived close to its place of work. See Bodnar, Immigration; Couvares, The Remaking of Pittsburgh; E.P. Erickson and W.L. Yancey, "Work and residence in industrial Philadelphia", Journal of Urban History, 1979, 5, pp. 147-182; O. Zunz, The Changing Face of Inequality (Chicago: the University of Chicago Press, 1982).

¹⁰² The reasoning behind the presentation of a resolution by the Montreal Builders' Exchange to city council was that there was "increasing difficulty in securing carters to expeditiously handle freight" and the "lack of sufficient cartage facilities" in the city. See Canadian Architect and Builder, July 1907, p. XII.

¹⁰³ The Canadian Engineer, January 1904, pp. 27-30; Dales, Hydroelectricity, p. 103; Hogue, et al., Quebec, pp. 25-26. Although Hogue et al. state that in 1893 Royal Electric distributed power to fifty-three establishments which had installed electric motors, they do not provide information about which type of establishments these were. See p. 42.

Dominion Cotton.

Considering the interest and depreciation on a steam plant, the cost of the rental electric power was no more than steam would have cost. ... [Moreover] all that could reasonably be expected in the way of flexibility, centralization of control, reduction of attendance, and minimization of stoppages together with ability to make up for delays by running any desired section overtime was accomplished.¹⁰⁴

Other factories were to follow suit. The two large railway car factories built in the east end after 1900 - the Locomotive and Machine Company of Montreal and the Angus Shops of the Canadian Pacific Railway - both installed their own electric power generators and purchased power from the utility company.¹⁰⁵ Because of the cheapness of electricity compared to steam power (about fifty-five per cent) and other advantages the demand from industrial users for electric power grew dramatically after 1900 as manufacturers began to substitute electric motors for steam engines.¹⁰⁶ By the second decade of the new century electricity had become the predominant power source in manufacturing.¹⁰⁷

At the same time, the electrification of the city considerably extended and

¹⁰⁴ Dales, Hydroelectricity, p. 103.

¹⁰⁵ Dales, Hydroelectricity, p. 103.

¹⁰⁶ J.A. Burnett, "The cost of industrial power", The Journal of the Engineering Institute of Canada, 1923, 6, 3, pp. 140-141.

¹⁰⁷ Dales, Hydroelectricity, pp. 112-113. The census provides some revealing statistics. In 1901 the 572 electric motors in use in Quebec's manufacturing sector generated less than ten per cent of the province's motive power; ten years later the number of motors had increased ninefold (to 4,939) and accounted for almost half of the horse power generated in manufacturing, rising to more than two-thirds by 1927. Canada, Census of Canada, 1901, vol. 3, Table VI, pp. 100-105; Canada, Census of Canada, 1911, vol. 3, Table VI, pp. 158-163; Canada, Manufacturing Industries of the Province of Quebec, 1931 (Ottawa: Dominion Bureau of Statistics, 1933), Table 10, p. 24. These figures probably underestimate the degree to which electricity was used in Montreal's manufacturing firms as many of the rural and small town firms used a greater amount of steam and water power.

deepened the hierarchy of locational advantages available to firms. A larger selection of superior and inferior sites emerged within the city. One role of the trolley and the telephone was to enable those firms that had the potential to move manufacturing facilities out of the city core to take advantage of the extension of the urban perimeter. This occurred in two ways. First, as large firms integrated a number of different processes under one roof they were able to increasingly do without the agglomeration economies of the core, and thus had greater potential to move from the core to new locations in the expanded city serviced by the new power and telephone facilities. With the movement to new ways of organizing production, new work spaces within the firm and within urban space became an important component of economic viability. The greater velocity and scale of the work process demanded the reformulation of the locational choices of firms and industries. The cheaper land prices of the periphery coupled with the larger expanses of available land (for the initial building and for later expansion) made industrial development in the suburbs an extremely attractive option to those manufacturers able to free themselves from the ties of the more central business districts. The rearrangement of the internal structure of the firm could only be realized if there was a restructuring of factory space. Often times this was only achieved on a new site on the periphery. The long-term result was that the possibilities of locational choice was greatly extended for those firms that could implement changes in the internal structure of the firm; and the greater range of locational choices was made possible by the extension of the urban network brought about by the trolley and the telephone.

Second, the electrification of the city expanded the perimeters of the urban labour market. The reorganization of the labour process fragmented work relations and this became implanted upon the urban landscape. The increasingly segmented character of the labour force freed manufacturers from dependence on skilled labour and created new labour demands. At the same time, the expansion of unskilled labour made workers a much more replaceable commodity. The development of a more flexible labour market facilitated the firm's locational possibilities. For example, managers of the increasing number of large firms were able to further differentiate activities over space. One method was through the separation of the head office from the factory as the telephone reduced the importance of face-to-face contacts within and between firms. Another was by taking advantage of the creation of working-class districts that were incorporated, by the extension of the urban sphere opened up by the trolley, into the potential labour markets of new firms that were established on the periphery. Although I have not found any evidence for Montreal, it has been argued that suburban workforces before World War II tended to be paid less than more centrally-located ones and were also less likely to be organized, either in terms of class-based community participation or labour organizations. The development of satellite communities on the urban fringe also isolated workers from one another.¹⁰⁸

¹⁰⁸ The argument that lower wages were associated with distance from the city core goes as follows: "wage rates are likely to be high where the demand for labor is high relative to (spatially-determinate) supply, and they are likely to be low where demand is low relative to supply. See A.J. Scott, "The spatial structure of metropolitan labor markets and the theory of intra-urban plant location", *Urban Geography*, 1982, 2, 1, p. 6. There has been little research on the urban geography of labour protest despite Gordon's assertions about the relationship between labour activity and decentralization. Cumber's study of Fall

The state, local alliances and new social spaces

While the physical structure of Montreal underwent dramatic changes, the city's population of Montreal and its environs grew greatly between 1881 and 1911 (Table 6.4). The city increased from 140,247 in the former year to almost half a million in the latter. In 1911 it was the ninth largest city in North America.¹⁰⁹ Associated with the massive growth that was taking place in Montreal and the surrounding area was the reorganization of the city's housing market (Figure 6.3). In this period Montreal experienced two major building booms. The first from 1886 to 1893 saw, at its peak in the late 1880s, a thousand new dwellings being constructed each year. The depression of the 1890s slowed building considerably. It was not until 1905 that a new boom was underway, one that was to last until 1912. At its peak, almost 3,000 new buildings were being constructed.¹¹⁰ The dramatic growth of Montreal and the reorganization of its housing stock would not have been possible without the concerted efforts of two key institutions: the state and land promoters.

One of the important roles of the state was the channelling of large chunks of capital into and/or the legitimization of the monopolization of critical

River, Rhode Island and Lynn, Massachusetts, however, provides some clues. In Fall River the scattering of textile mills across the city's periphery after 1890 created separate neighbourhoods in which groups of workers were isolated from one each other and socializing took place locally. In contrast, factories in Lynn remained centrally located and the resulting proximity of work and residence of the majority of workers created strong community and organizational bonds. See Working Class Community.

¹⁰⁹ The city's tremendous growth in the first decade of the new century was partly to do with internal population growth and with the massive wave of annexation that occurred between 1905 and 1910.

¹¹⁰ Two things should be noted here. First, these figures refer to all building construction and second, that each residential structure is not equivalent to a household as most residential structures contained two or more dwelling units.

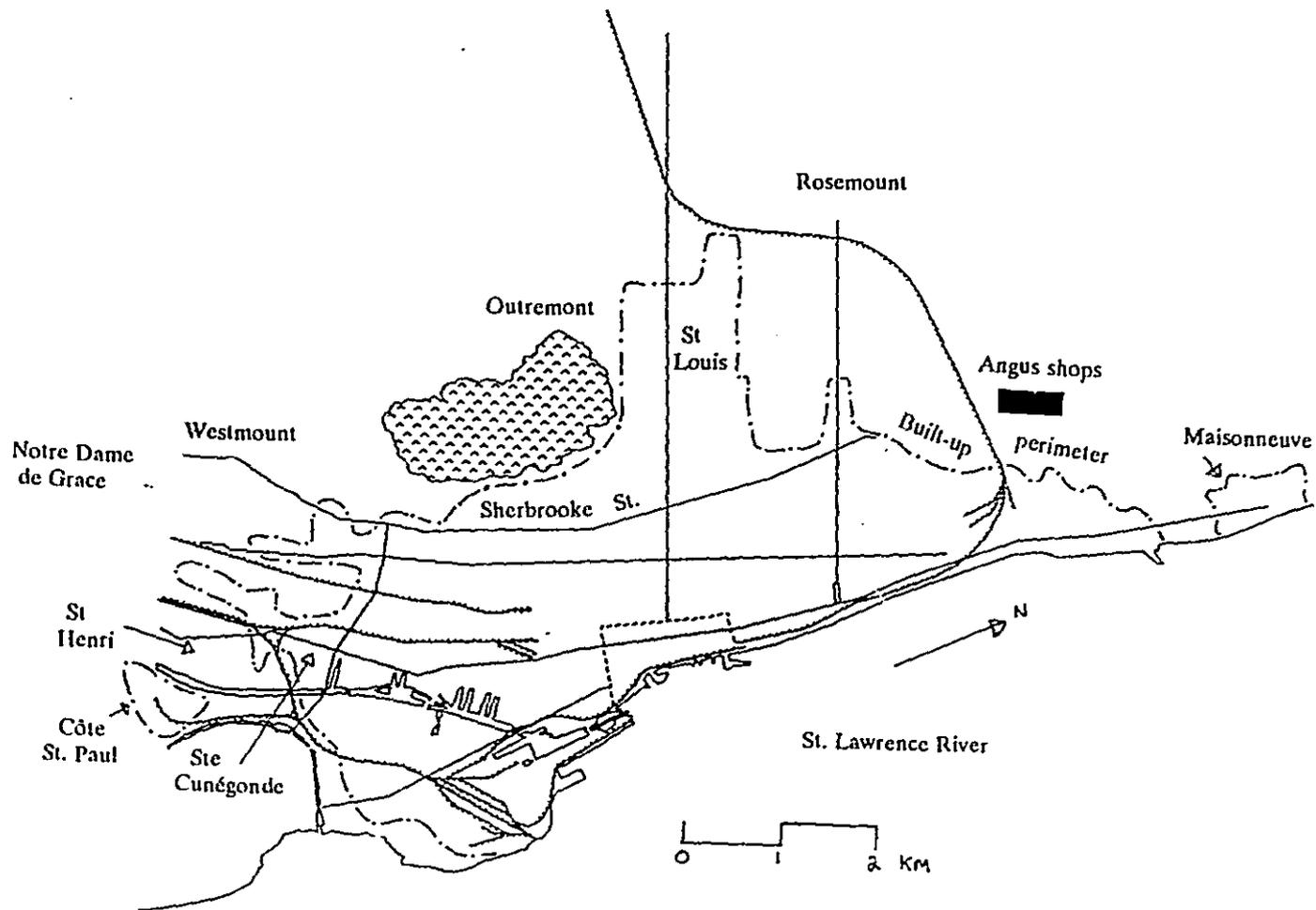
TABLE 6.4
MONTREAL AND SUBURBAN POPULATION, 1881-1911

	1881	1891	1901	1911
Island of Montreal	191,840	276,810	360,156	554,175
City of Montreal	140,247	216,650	267,730	470,480
St-Henri	6,415	13,413	21,192	30,335
St-Jean Baptiste	5,874	15,423	26,754	21,116
St-Cunégonde	4,849	9,291	10,912	11,174
Hochelaga	4,111	8,540	12,914	26,980
Lachine	2,406	3,761	5,561	10,699
Notre-Dame-de-Grace	1,524	2,305	2,225	5,217
Westmount	884	3,076	8,856	14,579
Côte St-Louis	751	3,537	10,933	37,000
Outremont	307	408	1,148	4,820
Maisonneuve	-	1,226	3,958	18,684

Note: the population of towns and cities have been included after they were annexed by Montreal.

Source: Canada, Census of Canada, various years.

FIGURE 6.3
MONTREAL, 1901



infrastructures. As we saw in Chapter Five the flow of state funds, such as into quasi-public institutions as the Montreal Harbour Commission, provided the basis for the continued importance and the development of new nodes of economic activity. At the local level, the extension of long-term contracts to private utility companies allowed for companies such as the Montreal Street Railway Co. and the Montreal Light, Heat and Power Co. to acquire *de facto* monopolies in the Montreal regional market¹¹¹, while at the national level, the monopoly of other utilities such as the telephone, despite a parliamentary inquiry in 1905, "was not directly challenged."¹¹² Furthermore, the city councils of Montreal and the surrounding industrial suburbs such as Saint-Henri also allowed unregulated and uncontrolled development to take place through a general lack of planning.¹¹³ Throughout the nineteenth and early

¹¹¹ Although it achieved a regional monopoly of the transit system (it absorbed its suburban rivals the Montreal Park and Island Railway Company in 1901, and the Montreal Island Belt Line Railway Company in 1907), the Montreal Street Railway Co. remained locked into a non-expansion policy which pitted it against land developers, commuters, the city and suburban councils. The former, who saw expansion of the trolley network as a shaky financial proposition, fought the demands of the building industry and consumers for track extensions and better service. For a general discussion of the politics of tramway and urban growth see C. Armstrong and H.V. Nelles, "Suburban street railway strategies in Montreal, Toronto and Vancouver, 1896-1930" in G.A. Stelter and A.F.J. Artibise (eds.), Power and Place. Canadian Urban Development in the North American Context (Vancouver: University of British Columbia Press, 1986), pp. 187-218. For an examination of the relationship between the tramway company and a municipality see Linteau, The Promoters' City, pp. 87-96.

¹¹² Taylor, "Charles F. Sise", p. 25.

¹¹³ For a discussion of city planning see T.I. Gunton, "The ideas and policies of the Canadian planning profession, 1909-1931" in A.F.J. Artibise and G. Stelter (eds.), The Usable Urban Past: Planning and Politics in the Modern Canadian City (Toronto: Macmillan, 1979), pp. 177-195; N. Hanson, "The emergence and development of zoning controls in North American municipalities: a critical analysis" (Papers on Planning and Design, No. 14, Department of Urban and Regional Planning, University of Toronto, 1977); and W. Van Nus, "Towards the city efficient: the theory and practice of zoning, 1919-1939" in Artibise and Stelter (eds.), The Usable Urban Past, pp. 226-246. For greater detail on the Montreal area see Copp, The Anatomy of Poverty, chap. 5; C. Ouellet, "Les élites municipales et la municipalisation de Saint-Henri et Sainte-Cunégonde, 1875-1878" (Unpublished paper, Université du Québec à Montréal, 1982); and La Société historique de Saint-Henri, Portrait d'une ville, Saint-Henri 1875-1905 (Montréal: La Société historique de Saint-Henri, 1987), pp. 5-13.

twentieth centuries the only formal land-use controls introduced by municipalities dealt with fire and nuisance industries. Even by the end of World War I, in Montreal according to the town planner James Ewing,

we find, owing to unregulated and uncontrolled development, ... factories springing up promiscuously all over the place and spreading in their neighbourhood ugly, malodorous and grimy conditions, forcing up the cost of land but depreciating residential values with the inevitable consequence that buildings fall into disuse, decay and delapidation, and the foul reeking cankerous slum is created.¹¹⁴

When the actions and inactions of the state are allied with the demands of local land developers the result is to create a land market whose internal irrationalities produced a segregated urban fabric by class and ethnicity.

Land promoters were one of the most powerful forces shaping the metropolis through their control over land and their connections with local government. In the Montreal suburb of Notre Dame de Grâce for example, the role played by the municipal government alongside the extension of the trolley along Sherbrooke street after 1907 was responsible for the building of a middle-class, white-collar, anglophone suburb. The suburban government built up a substantial infrastructure, installed essential services, and established by-laws which restricted the type and cost of housing that were to be built. In Maisonneuve a similar set of circumstances was obvious with land developers and civic leaders laying down a systematic array of policies around land development, infrastructure and services, but, different from Notre Dame de Grâce, developing an industrial policy based on a widespread

¹¹⁴ The Journal of the Engineering Institute of Canada, December 1921, p. 413.

advertising campaign and financial inducements to manufacturers. Saint-Henri and Sainte-Cunégonde, like Maisonneuve and in contrast to middle-class suburbs such as Notre Dame de Grâce, Westmount and Outremont, established a set of municipal policies which favoured business interests over those of their residents.¹¹⁵

The timing of the construction of new spaces was closely linked to the electrification of the city and its surrounding districts. The electrification of Montreal's transit system was associated with the building boom which started in the late 1890s and extended into the first decade of the twentieth century.¹¹⁶ By and large, this spurt of building activity was confined to the periphery of the city.¹¹⁷ The opening of new peripheral housing developments, some of which took place in middle-class districts such as Westmount, Outremont and Notre Dame de Grâce, provided extensive tracts of cheap working-class housing in areas such as Saint-Jean-Baptiste, Saint-Louis de Mile End and Maisonneuve. Large development companies were the active force behind these developments: the Park Realty Company had 3,000 lots for sell in their "Park Avenue Extension" in 1908; the Kensington Land Development Company along with the Park and Island Railway Company were

¹¹⁵ W. Van Nus, "The role of the suburban government in the city-building process: the case of Notre-Dame-de-Grace, Quebec, 1876-1910", Urban History Review, 1984, 13, 2, pp. 91-103; Linteau, The Promoters' City; Ouellet, "Les élites municipales"; J-P. Collin, "La Cité sur mesure: spécialisation sociale de l'espace et autonomie municipale dans la banlieue montréalaise, 1875-1920", Urban History Review, 1984, 13, 1, pp. 19-34. The same pattern was evident elsewhere in North America. See Jackson, Crabgrass Frontier and Warner, Streetcar Suburbs.

¹¹⁶ D.B. Hanna, "Montreal, a city built by small builders, 1867-1880" (Ph.D. thesis, McGill University, 1986), p. 9.

¹¹⁷ G.J. Levine, "Class, ethnicity and property transfers in Montreal, 1907-1909", Journal of Historical Geography, 1988, 14, 4, p. 368.

powerful forces behind the development of Notre Dame de Grâce West; and the Rosemont Land Improvement Company was the principal developer in the building-up of Rosemont.¹¹⁸

Despite the expansion of the city boundaries, however, suburban housing was out of reach of a portion of the working class. One reason was that a great deal of employment continued to be found in the city core. As many working-class families were dependent upon more than one income, and the price of the trolley was too high given the family income, a large number of families was unable to move to the urban fringe, despite the fact that in Montreal "the majority of tenement tenants [are] paying far more for their two floors than people in Toronto pay for a 'self-contained' home and a bit of garden".¹¹⁹

For all of that, working-class families continued to move to the periphery. In some cases they moved into housing built by the formal construction industry. In other cases, workers built their own housing. At the turn of the century, Kensington at the western extremity of Notre Dame de Grâce was a shack town of "cheap, one-storey wooden houses"; Italians in Mile End were building their homes out of discarded material and adding on as means allowed; while in 1911 Dr. E. Pelletier, the province's Health Council secretary, reported that Montreal had peripheral "assemblages de cabanes et de hangars construits en planche, couverts de papier-

¹¹⁸ Canadian Architect and Builder, March 1908, p. 15; Cooper, Montreal, pp. 126-128; M. Choko, Crises du logement à Montréal (1860-1939) (Montréal: Albert Saint-Martin, 1980), p. 58.

¹¹⁹ Canadian Architect and Builder, December 1892.

goudron, retenu avec de fer blanc".¹²⁰ In the northern part of the city, alongside the lines of the Montreal Park and Island Railway Co.,

city mechanics are buying bush lots, clearing the sites and building houses for themselves. Forty or Fifty humble dwellings, erected close together in one spot, resemble more a clearing in the backwoods than the embryonic suburb of a great city.¹²¹

However, the ability of the housing and land markets to satisfy the demand for the working class must not be overstated. The availability of cheap and decent housing, both in the inner city and the new suburban developments, was not extensive.¹²² Nonetheless, a significant share of Montreal's working-class population lived on the city periphery and in the newly-developed suburbs.¹²³ These working-class districts were differentiated along the lines of class and ethnicity. The influx of large number of immigrants after 1890, coupled with the way that they were integrated into the labour force laid the basis for the segmentation of the urban milieu. While some commentators argued that Montreal's inner-city slums, among the worst in North America, were due to the concentrations of immigrants, most

¹²⁰ Van Nus, "The role of the suburban government", p. 97; B. Ramirez, "Montreal's Italians and the socioeconomy of settlement: some historical hypotheses", Urban History Review, 1981, 10, pp. 39-48; Pelletier quoted in Choko, Crises du Logement, p. 25.

¹²¹ E.J. Chambers, Suburban Montreal as Seen From the Routes of the Park and Island Railway Co. (Montreal: Desbarats, 1895), p. 36. For a discussion of working-class self-builders see R. Harris, "A working-class suburb for immigrants, Toronto 1909-1913", Geographical Review, 1991, 81, 3, pp. 318-332.

¹²² T. Copp, The Anatomy of Poverty, chap. 5.

¹²³ Within the city in 1901 peripheral wards such as Sainte-Marie, Saint-Gabriel and Hochelaga were overwhelmingly working class. See Lewis, "The segregated city", Table 3, p. 143. The surrounding industrial districts such as Saint-Henri, Sainte-Cunégonde, Lachine and Maisonneuve which together accounted for more than 40,000 people were also largely made up of working-class families. See Canada, Census of Canada, 1931 (Ottawa: J.O. Patenaude, 1933), vol. 2, Table 12, pp. 52-53.

immigrant groups coalesced around a number of residential nodes, both in the core and elsewhere.¹²⁴ In the late nineteenth century, Italian settlements developed around five nuclei, two of them in the west (Goose Village) and east (Tetreaultville area of Hochelaga) of the city. By World War I an extensive Italian settlement in the north end along the Canadian Pacific tracks in Mile End had developed so as to have "use of free cultivable land in the city outskirts" and to be close to the Angus car shops, the city's largest employer of Italian labour.¹²⁵ Likewise, the Ukrainians, most of whom worked in the metal sector, had important settlements close to the Grand Trunk shops in Pointe Saint-Charles and near the Angus shops.¹²⁶ As these examples suggest, many of the working-class suburban districts before World War I were a mix of housing and industry: starting in the 1870s towns such as Saint-Henri and Sainte-Cunégonde became industrial suburbs, Lachine developed an industrial base from the 1880s, Maisonneuve in the 1890s, and the area to the north along the Canadian Pacific tracks by the beginning of the war.¹²⁷ As I show in later sections

¹²⁴ For example, one observer writing in the Canadian Architect and Builder, June 1907, p. 90, stated that Montreal's slums were the worst in Canada because of the heavy stream of immigrants in summer, the existence of sojourners who only stay for a short time, and the oldness of the buildings. Another writer stated that because of "speculators and wire pulling" suburbanization was expensive and thus increased pressure on the inner city. See Canadian Architect and Builder, December 1892.

¹²⁵ The quote is from B. Ramirez and M. Del Balzo, "The Italians of Montreal: from sojourning to settlement, 1900-1921" in R.F. Harney and J.V. Scarpaci (eds.), Little Italies in North America (Toronto: The Multicultural Society of Ontario, 1981), p. 75. See also J. Boissevain, The Italians of Montreal (Ottawa: Information Canada, 1970), pp. 1-4; Ramirez, "Montreal's Italians".

¹²⁶ C.H. Young, The Ukrainian Canadians (Toronto: Thomas Nelson and Sons, 1931), pp. 114-125.

¹²⁷ The development of industrial suburbs in the nineteenth century composed, in the large part, of the working class was not unique to Montreal. Detroit was surrounded by areas such as Dearborn, Highland Park and Hamtramack, while Toronto was ringed by the industrial suburbs of West Toronto Junction, New Toronto and Swansea. See Zunz, The Changing Face of Inequality and D. Beeby, "Industrial strategy and manufacturing growth in Toronto, 1880-1910", Ontario History, 1984, 76, 3, pp.

of this chapter, towns like Maisonneuve, Saint-Henri and Sainte-Cunégonde grew up around a large work force (mainly French-Canadian) and early clusters of manufacturing firms, and by the end of this period were some of the most important industrial districts in Canada.

6.4 The Changing Industrial Geography of Old Montreal and the Outer Core

In Chapter Five it was shown that a distinct spatial division of manufacturing had emerged in Montreal by as early as 1850: a heavy concentration of firms in the central core and the appearance of important non-central nuclei in the West and East Ends. In this section I turn to an examination of the changing industrial geography of Old Montreal and the Outer Core between 1880 and 1918, emphasizing the continued diversity and the changing shares of industry in the two zones.

In 1890 production was still heavily centralized. Old Montreal and its adjacent districts (the Outer Core) still accounted for seventy-two per cent of all firms and about half of manufacturing rents (Table 6.5). Although this was a fall from 1861, the decline occurred solely in Old Montreal: its relative share of firms and rent dropped to about a quarter, although in absolute figures its manufacturing rent increased threefold. The Outer Core, especially Saint-Antoine, experienced tremendous growth between 1861 and 1890, its proportion of manufacturing rents increasing from one quarter to one third.

TABLE 6.5
MONTREAL MANUFACTURING FIRMS BY DISTRICTS, 1890

District	FIRMS		Total	RENT		
	No.	%		%	Mean	Median
Old Montreal	379	28.0	182,905	24.2	483	300
Outer Core	600	44.4	242,070	32.0	403	200
St-Antoine	355	26.3	190,640	25.2	537	280
St-Lawrence	123	9.1	32,350	4.3	263	150
St-Jacques	119	8.8	18,280	2.4	154	100
West End	225	16.6	215,694	28.5	959	240
Lachine	68	5.0	92,740	12.2	1,364	310
Griffintown	67	5.0	41,360	5.5	617	300
St-Henri	88	6.5	80,834	10.7	919	150
East End	142	10.5	109,940	14.5	774	120
Ste-Marie	127	9.4	87,260	11.5	687	120
Maisonneuve	10	0.7	22,150	2.9	2,215	90
City Total	1,352	100.0	757,309	100.1	560	200

Note: included in the city total but excluded from elsewhere in the table are sixteen firms (with combined rent of \$8,590) that could not be allocated to existing districts.

Source: City of Montreal, Rôle d'évaluation, 1890; Saint-Henri, Rôle d'évaluation, 1890; Sainte-Cunégonde, Rôle d'évaluation, 1890; Côte Saint-Paul, Rôle d'évaluation, 1895.

The relative decline of Old Montreal

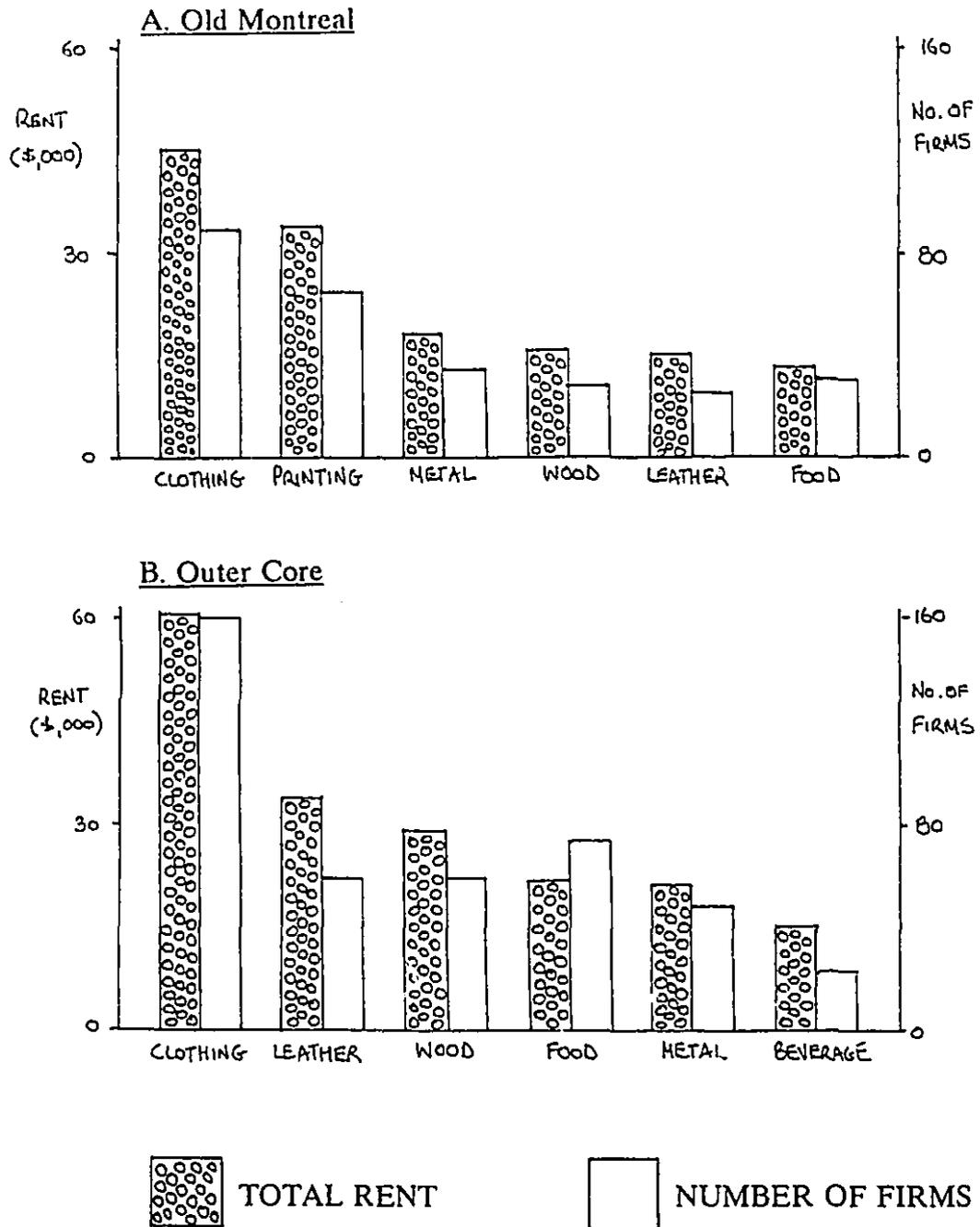
From the 1880s, the enhanced attraction of Old Montreal for finance and retailing made it relatively less attractive as a manufacturing location for a number of industries. The expansion of banking and insurance reflected the importance of Montreal as a regional and national financial centre, and their new multi-storeyed and specialized buildings were not suitable for many manufacturing activities. Population growth and increasing demand for products facilitated the development of retailing in Old Montreal. Although the new department stores were locating on Saint-Catherine street closer to the high-rent neighbourhood to the north, Old Montreal saw a proliferation of dry goods merchants and specialized retail outlets, which were made accessible through the convergence of horse car and the electric street railway facilities at Place d'Armes. The growth of these activities spurred the price of land, and squeezed out many of the smaller manufacturers, as well as many of the larger ones. With the changing character of industry came the restrictions imposed by the need for new plant layouts to facilitate the faster circulation of capital through the firm. The attraction of the warehouse district declined as more and more firms turned to a horizontal layout rather than a vertical one. A last pressure, the separation of office from that of manufacturing functions, led to growing service sector employment in Old Montreal at the expense of blue-collar jobs. Many of Montreal's firms had by 1890, and increasingly in the following years, divorced office activities - accounting, buying and selling, executive functions, etc - from manufacturing. Many of the large manufacturers we have discussed - the flour

companies of Ira Gould and the Ogilvies, Canada Sugar and Canadian Rubber - had large factories in the east or west end of the city, but now located their offices in Old Montreal close to the financial establishments of Saint-James street.

The continued diversity of Old Montreal

Despite these pressures the central core remained a source of manufacturing growth, and between 1861 and 1890 the number of firms in Old Montreal increased forty per cent (from 270 to 379). The area was still characterized by diversity, and by concentrations of clothing, jewellery and printing firms, although its importance as a centre for these trades had declined (Figure 6.4). With a third of the city's firms and forty-two per cent of its rent, Old Montreal remained an important locus of the city's clothing and ancillary industries. Much of the clothing industry still remained rooted to the core as it depended upon agglomeration economies of all types. The one hundred "hands" of Robert McNabb's Montreal Whitewear factory manufactured "innumerable designs and varieties of novelties" in aprons, blazers, coloured shirtings, flannel underwear, ladies blouses, infant's and children's underwear, night robes, caps and shirts". In aprons alone, "their assortment ... ranges from the cheapest cotton to the finest lace and satin, embracing about 100 varieties". Likewise, E.A. Small and Company made "every style of goods, from the lowest classes up to high class goods which heretofore had been only procurable of custom make, and were never attempted in ready made lines." These goods were made-up in a six-storey building on Saint-James street where hundreds of women were employed on "several hundred

FIGURE 6.4
LEADING SECTORS IN OLD MONTREAL AND THE OUTER CORE
BY TOTAL RENT AND NUMBER OF FIRMS, 1890



Source: City of Montreal, *Rôle d'évaluation*, 1890

sewing machines with the latest improvements".¹²⁸ While the wide range of products and styles forced clothing firms to find a central location so as to cut down on production costs induced by the constant changes, many firms were still reliant upon the putting-out system. As well as the hundreds working in his Montreal factory, Small also had "several hundred in the surrounding districts who do their work at home."¹²⁹ As E.J. Chambers noted in 1903, this was still common practice:

[t]he Montreal wholesale clothing houses have availed themselves of ... extremely industrious and very adept needlewomen ... and, as a result, thousands of farm houses throughout the province of Quebec may now be described as branch workshops of the great Montreal distributing houses.¹³⁰

By the end of the century, however, despite Chambers' claim, rural out-work was on the wane as supervision of home workers was difficult and besides they were generally unskilled and the transporting of raw material and finished goods was cumbersome.¹³¹ One solution was the development of putting-out in districts adjacent to Old Montreal such as Saint-Jacques where greater supervision and lower circulation time could be implemented. Another solution was the development of a new form of production - contract work. By 1900 sub-contracting had taken over

¹²⁸ For McNabb see Canadian Journal of Commerce, November 1, 1889, p. 772. The information for Small comes from Canadian Journal of Commerce, April 29, 1887, p. 963 and Special Number of the Dominion Illustrated, p. 45.

¹²⁹ Special Number of the Dominion Illustrated, p. 45.

¹³⁰ Chambers, The Book of Montreal, p. 171.

¹³¹ M. Payette-Daoust, "The Montreal garment industry, 1871-1901" (M.A. thesis, McGill University, 1986), pp. 105-110; F.R. Scott and H.M. Cassidy, Labor Conditions in the Men's Clothing Industry (Toronto: Thomas Nelson and Sons Ltd., 1935), pp. 1-2; G.L. Teal, "The organization of production and the heterogeneity of the working class: occupation, gender and ethnicity among clothing workers in Quebec" (Ph.D thesis, McGill University, 1986), chap. 3.

from putting-out because contractors were able to produce superior work, they specialized in a particular type of product, and could better supervise the work process. The growth of the contract shop was tied into the Jewish immigration beginning in the 1880s.¹³² The requisite for contract shops included a small degree of capital to buy the necessary machinery, properly trained labour, and the exercising of "the most rigid economy in material and the utmost closeness in buying". By the late 1880s there had developed in Montreal a number of "small skilled manufacturers who depend on their livelihood upon the execution of some particular branch for the large wholesale houses or factories" such as jersey and mantle braiding, flossing of men's shirts and childrens' wear, machine button-hole making, ostrich-feather dyeing and curling, and the making of braids.¹³³

Supporting the continued importance of the central core as a manufacturing district was the reconstruction and expansion of critical infrastructures. Although the remaking of the harbour had hardly ceased since the 1840s, the period at the turn of the century was one characterized by some fundamental changes. In 1898 Israel Tarte, the Public Works Minister, initiated a major redevelopment of the harbour, completed by World War I. Between 1896 and 1914 the federal government funnelled more than \$32 million into harbour improvements, mostly in the area

¹³² Payette-Daroust, "The Montreal garment industry", p. 107; J. Rouillard, "Les travailleurs juifs de la confection à Montréal (1910-1980)", Labour/Le Travailleur, 1981/82, 8/9, p. 255.

¹³³ Canadian Journal of Commerce, August 3, 1888, pp. 212-213. It should be noted that even at this date many of these contract shops were under attack from the large inside shop. For example, the same writer stated that the business of the machine button-holer was "slowly departing" because the large firms "now run their own machines and no longer send their work out to be done." Jersey braiding, on the other hand, had ceased to exist in Montreal because of the flood of braided jerseys from Germany.

bordering Old Montreal. This included the construction of a seawall to keep out floods, and more quays; the building of fourteen permanent steel and concrete storage hangars between 1904 and 1908 and another seven between 1911 and 1914; the replacement of antiquated floating grain elevators by two fixed ones; the taking over, rationalization, and extension of the railway tracks which criss-crossed the wharves; and the building of a large dry dock, a coal tower, a saw mill, a floating crane and the buying of new tug boats. Thus, by the beginning of World War I, the harbour had undergone some massive changes.¹³⁴ Similar expansion of the railway system also provided physical facilities for centrally-located manufacturers. Take the Canadian Pacific Railway for example. On the western and eastern boundaries of Old Montreal were the company's two passenger terminals - the Windsor and Place Viger stations respectively - which, in turn, were linked to the Sortin and Hochelaga freight yards and the Harbour Commissioner tracks strung along the harbour front.¹³⁵

The impact that the reconstruction of the physical structure of the central district had upon the viability of Old Montreal was reinforced by the continued existence of an important set of agglomeration economies. Despite the increasing number of people moving to the suburbs, the central districts of Montreal were "one

¹³⁴ R. Blanchard, *L'Ouest du Canada français: Montréal et sa région* (Montréal: Beauchemin, 1953, pp. 279-280; M.T.S. Casey, "The use of the power for port facilities", *The Engineering Journal*, 1924, 7, pp. 486-488; F.W. Cowie, "The great national port of Canada. Features of the important extension work in progress in Montreal harbour", *The Canadian Engineer*, January 18, 1912, pp. 178-183; P.-A. Linteau, "Le développement du port au début du 20e siècle", *Historical Papers, Canadian Historical Association*, 1972, pp. 181-205.

¹³⁵ "A notable group of railway terminals", *The Canadian Engineer*, September 23, 1915, pp. 403-404.

of the most densely populated areas, outside of New York city, on the continent".¹³⁶ While the harbour and railway facilities were strung out to the south, ringing Old Montreal to the north were vast stretches of working-class housing where workers of different skills and nationalities had immediate access to the firms of the core.¹³⁷

Printing in Old Montreal

Printing provides an illustration of the forces which sustained the central agglomeration node. Despite tremendous changes in its social and organizational structure, the industry remained in Old Montreal.¹³⁸ A central feature of the industry was the growing differences between newspaper publishing, and book and job printing. From the 1850s, a growing market and capitalization in the newspaper branch permitted the introduction of new technologies and a more elaborate division of labour. At mid century a number of technological factors were critical in the newspaper branch of the industry: the rotary press; the steam-powered cylinder machine which replaced hand feeding by machine feeding; the cheapening of newsprint due to innovations in which paper was made first from straw, and later by wood pulp; and the arrival of the telegraph. In the 1870s the Bullock press, using the

¹³⁶ Canadian Architect and Builder, November 1892.

¹³⁷ Ramirez, "Montreal's Italians and the socioeconomy of settlement"; J. Seidel, "The development and social adjustment of the Jewish community in Montreal" (M.A. thesis, McGill University, 1939); Young, The Ukrainain Canadians.

¹³⁸ In 1890 Old Montreal contained two-thirds of the printing firms of the city and almost three-quarters of its rent.

stereotyping process, replaced the "old blanket sheet" with the "quarto page" and allowed publishers greater speed and greater flexibility in the production process. While the rotary press heralded the deskilling of pressmen, the introduction of the linotype machine in the 1890s, in which one machine did the work of five workers, became the major innovation which did away with the skilled character of typesetters.¹³⁹ The linotype machines of the Linotype Co. established close to the printing area of the city in 1891 were quickly installed in all of Montreal's major publishing houses by the end of the century, and the smaller ones by 1910.¹⁴⁰

Under intense waves of mechanization, the increasing subdivision of tasks, and the battle for control of the labour process, clashes between workers and proprietors were an important facet of the trade. Thus in 1890 when the Montreal *Herald* was having "problems" with their printers, the publisher stated that he would suspend publication for a month rather than give in to the strikers and threatened that "labor saving machinery [typesetting machines] will be next in order".¹⁴¹ Printers had

¹³⁹ J. De Bonville, La presse québécoise de 1884 à 1914. Genèse d'un média de masse (Québec: Les Presses de l'Université Laval, 1988); C. Bruce News and the Southams (Toronto: Macmillan, 1968); D. Fetherling, The Rise of the Canadian Newspaper (Toronto: Oxford University Press, 1990), pp. 28-30; Kealey, "Work control"; P. Rutherford, A Victorian Authority: the Daily Press in Late Nineteenth-Century Canada (Toronto: University of Toronto Press, 1982).

¹⁴⁰ De Bonville, La presse québécoise, pp. 104-105. For example, *The Montreal Star* introduced fourteen machines in 1895 and *La Presse* had twelve by 1900. For a description of the company and the linotype process see Faustus, An Epoch in Printing, by Faustus: Being the First Matter Set on the First Linotype Machine Manufactured in Canada (Montreal: Linotype Company, 1892).

¹⁴¹ Canadian Journal of Commerce, June 6, 1890, p. 1078. The history of strikes in the printing industry goes back to as early as the 1860s when all of Montreal's printers except for two newspapers struck for higher wages; see Hamelin et al., Répertoire des Grèves, p. 22. They also list other incidents on pp. 45, 69, 76.

always been an elite work force, literate, informed and organized.¹⁴² They were able to adapt to the inroads by owners and managers to their control over production by making concessions to the introduction of machinery.

Despite the changes to the work content, the increasing capitalization of the industry, and a history of conflict, all types of printing establishments could be found in Old Montreal, ranging from the small book and job printer such as A. Carmel with a rent of \$100 in 1890 to the large printing and publishing house such as Gazette Printing which printed the Tory-English newspaper, *The Montreal Gazette* with a rent of \$2,000 (Figure 6.5). Old Montreal's printing industry contained a large array of productive strategies, the variety was endless. Take the lithographic branch for example. Within a stone's throw from each other were some of the largest lithographing companies in the country. The Sabiston Lithographic and Publishing Company which occupied four floors of the Gazette Building at the corner of Craig and Saint-Francois Xavier for a rent of \$1,500 in 1890 employed a wide range of skills and labour. As well as editors and print composers they employed art designers and engravers in their artists' department; skilled photographers, zinc etchers and plate mounters, as well as eighty-three unskilled "operatives" in their third-floor bindery and pressmen in their first-floor pressroom.¹⁴³ While they specialized in a variety of printed products, the Canada Bank Note Engraving and Printing Company did engraving on steel, wood and stone, chromo-lithographing, the new "artotype"

¹⁴² W. Roberts, "The last artisans: Toronto printers, 1896-1914" in G.S. Kealey and P. Warrian (eds.), *Essays in Canadian Working Class History* (Toronto: McClelland and Stewart, 1976), pp. 125-142.

¹⁴³ Dominion Illustrated Christmas Number, (Montreal, 1889).

process; they printed bank notes, debentures, bills of exchange, postage stamps, maps and books; and worked especially for agricultural and railway interests. Their large double building (rent of \$1,500) on Craig street near St Lawrence operated its presses on steam power and contained the "finest geometric lathe in America."¹⁴⁴ The nation's largest lithographer was the Burland Lithographic Company with a six-storey building at Bleury and Craig. In the late 1880s their 140 workers operated machines powered by a forty horsepower steam engine and manufactured, among other things, papers, cardboard, playing cards, tintype mats and photo mounts.¹⁴⁵ In contrast to these large factories was the engraving establishment of J.H. Walker, who worked only on wood, with a rent of \$80. Walker, like the larger establishments, was rooted to the central location, by the fact that he catered to "the double demands of the bookmaker and the merchant" and engraved "for publications and business houses."¹⁴⁶ While most printers and publishers in this period worked solely in the printing trade, some were vertically integrated. Jean-Baptiste Rolland, who in 1842 opened a book store on Saint-Vincent street, quickly added job printing and bookbinding facilities, and in 1881 set up a paper mill at Saint-Jérôme to supply cheap paper for his printing establishment in Montreal.¹⁴⁷

As well as being an important printing centre, Montreal was heavily involved

¹⁴⁴ Industries of Canada, p. 112.

¹⁴⁵ Industries of Canada, p. 170.

¹⁴⁶ Industries of Canada, p. 137.

¹⁴⁷ Industries of Canada, p. 119; P-A. Linteau, "Jean-Baptiste Rolland" in Dictionary of Canadian Biography, vol. 11 (Toronto: University of Toronto Press, 1982), pp. 765-766.

in publishing. Its newspaper houses were the largest establishments in the printing industry as a result of the massive changes that had begun at mid century and continued throughout the second half of the nineteenth century. The technological factors, alongside the greater distribution methods and the transformation of the market from one geared to serving a small commercial elite to one catering to an urban mass market, pushed the newspaper industry into a large-scale, mechanized form by the 1860s.¹⁴⁸

Despite the large scale, the conflict between labour and capital, and the rapid growth of the newspaper houses, Old Montreal remained the home of all the city's newspapers. Even when the buildings became too small to contain all the new machinery, the newspaper only moved a short distance away. Here was an industry that conforms to the type that were supposedly beginning to leave the city for the suburban areas or surrounding towns. The need to be close to the "communication economies" of Old Montreal, the ease of distribution, and the prestige of a central location were powerful attractions for the newspapers.¹⁴⁹

Expansion and diversification of the Outer Core

Well before 1890, Old Montreal had lost its position as the primary manufacturing centre of Montreal. The relative decline in importance of Old

¹⁴⁸ Rutherford, A Victorian Authority.

¹⁴⁹ An example of the prestige can be gleaned from the attention paid to the types of structures where the newspaper were housed. In 1914, The Printer and Publisher stated that the premises of the newspapers "depict rare architectural beauty hitherto restricted to banks and financial institutions". Quoted in De Bonville, La presse québécoise, fn 60, p. 145.

Montreal was paralleled by the increased importance of the Outer Core by 1890. Of the 721 firms that were added to the city's 1861 total of 631, half located in the immediate surroundings of Old Montreal. In 1890 the outer core accounted for 600 (or forty-four per cent) of the city's firms and a third of the rent. Together the three districts of Saint-Antoine, Saint-Lawrence, and Saint-Jacques had the greatest mass of manufacturing firms in the city. It also had a selection from all parts of the rent spectrum and industries. While the Outer Core's firms tended to have a large proportion of small and medium firms there was still a substantial number of larger firms: for example, there were nineteen firms with rents of \$2,000 or more. Examples are pharmaceutical factories such as that of Davis and Lawrence on Saint-Antoine street where in their four-storey building "every modern improvement that would facilitate the business has been adopted, such as steam elevators, hand railways, machines for bottle washing, bottle filling, bottle corking, etc". George Barrington made 200 lines of trunks, valises and satchels with "equipment [that] is entirely new" and the five-storey building "embodies every modern improvement for the perfection of their work."¹⁵⁰ There was a wide range of smaller firms, such as the family-owned bakery, blacksmithing shop and saddlery which served local markets, employed one or two workers, and had a low degree of capitalization, and the larger shoe and metal-working factories.

While the Outer Core became the home of many different industries, it also had important concentrations of several sectors such as clothing, tobacco, leather,

¹⁵⁰ Commerce of Montreal, pp. 168-169; Canadian Journal of Commerce, May 3, 1889, pp. 754-755.

and to a lesser extent, printing firms that were leaving the central district. To demonstrate this two examples will be presented. The first example is that of a firm, the jewellery firm of M. Cochenthaler. In the late 1870s he established himself as a manufacturer and dealer in watches, jewellery, plated-ware, clocks and diamonds in the heart of the financial district on Saint-James street. In 1906 he moved from Saint-James to the core of the new retail district of the city at Saint-Catherine at the corner of Metcalfe. He was fitting up his new premises with the latest style of fixtures, and much after the pattern of the jewellery stores on Fifth Avenue, New York." In the basement there was a "modern factory" where skilled workers were employed on "some very modern machinery".¹⁵¹ As firms such as Cochenthaler were pushed out of or had reasons for leaving Old Montreal, such as convenience to a wealthy and fashionable clientele, locations in the surrounding districts became increasingly attractive. Within walking distance of the financial, retailing and wholesaling activities downtown, firms in the outer core would have paid lower rents and still had relatively good access to a city-wide labour force.

While the case of Cochenthaler provides an illustration of one firm's reasons for moving from Old Montreal to the Outer Core, the example of cigarmaking presents a different perspective on mobility between the two zones. In Chapter 5.5 the Macdonald Tobacco Co. was presented as an example of a large-scale, mechanized firm which sought a new type of productive space in a location far from the city core. While Macdonald was able to break the ties which bound it to the

¹⁵¹ Industries of Canada, p. 112; Montreal Gazette, May 8, 1906, p. 7.

centre, most tobacco firms found it difficult to relinquish the advantages and to free themselves from the constraints of Old Montreal. This was especially true for cigar firms where the demand for workshops and buildings close to the centres of demand, finance and wholesaling, as in other industries I have touched upon in this study, was a critical factor in their survival. It was pressures such as reliance on wholesalers for raw leaf, the need for small workshops, access to transportation facilities and distributors that compelled cigar firms to remain rooted to a central location. As late as 1890 most cigar establishments were to be found in Old Montreal (Figure 6.6). This had changed by World War I; the Outer Core had become the primary manufacturing complex of the Montreal cigar trade. The rationale behind this can be illustrated through an examination of two cigar firms.

As was typical in the cigar industry, L.O. Grothé learnt the trade through an apprenticeship with a local cigar company. Starting off on his own in 1877 in a small shop on Notre Dame street in the heart of Old Montreal he expanded quickly. To accommodate this growth he moved just around the corner to a new premise on Saint-Peter street in 1888.¹⁵² Very soon, however, the limitations of a central location drove Grothé to seek a new factory space elsewhere. In 1901 a series of meetings were held with the council of the northern suburban municipality of Saint-Louis de Mile End who granted him a \$16,000 bonus.¹⁵³ Although for reasons I have not been able to decipher the company did not move north. Five years later,

¹⁵² Canadian Cigar and Tobacco Journal, March 1906, p. 53.

¹⁵³ Canadian Cigar and Tobacco Journal, September 1901, p. 437.

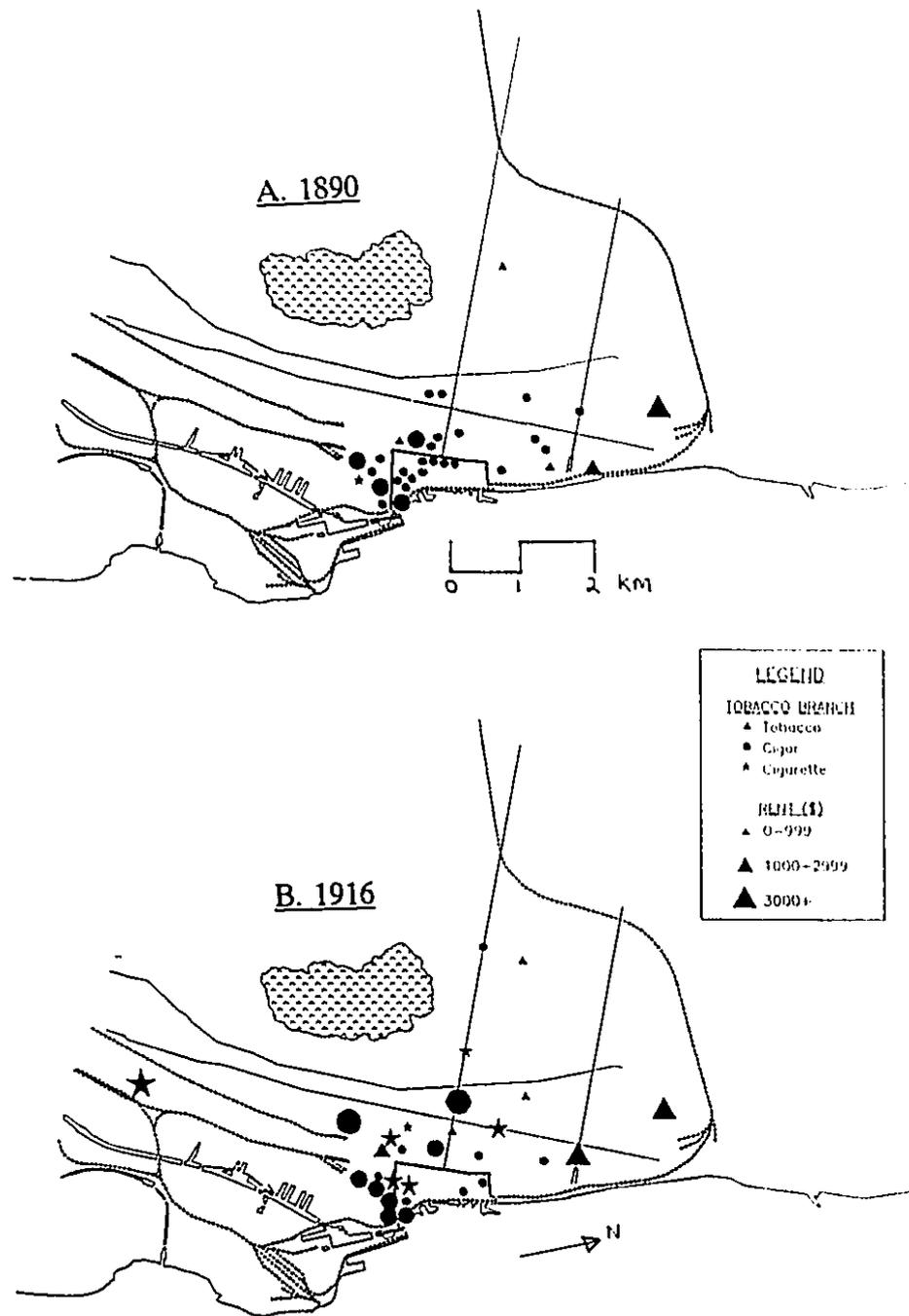
however, Grothé bought 22,000 square feet of land in the Saint-Laurent district on Ontario street between Saint-Lawrence and Charles Borromée (now Clark) streets where he built "[o]ne of the largest and finest cigar factories in Canada". Five floors high, it contained more than 100,000 square feet of floor space; the first floor used for offices and storage, while the rest of the building was devoted to cigar manufacture.¹⁵⁴ The new factory was geared to expanding production. Two pieces of evidence illustrate this. First, it was able to accommodate a much large number of workers - the work force increased from 300 at the old Saint-Peter plant to 600 on Saint-Lawrence. Associated with this was a massive increase in rent; it rose from \$750 in 1890 to \$8,000 in 1916. Second, it was built with the flow of material and the greater efficiency of labour in mind. One writer in 1913 exclaimed that the new factory "is celebrated for the economic arrangement and splendid equipment ... A visit to their plant constitutes a liberal education in modern cigar manufacturing methods."¹⁵⁵ As the industry was not mechanized major survival tactics were speeding up production and a more intensive exploitation of labour through greater specialization of tasks and greater speed of the transfer of time between tasks. The new factory of Grothé was built to maximize this process.

The largest cigar manufacturing firm of the period was that of S. Davis and

¹⁵⁴ The quote is from Canadian Cigar and Tobacco Journal, June 1906, p. 19. See also in the same journal, February 1906, p. 43; March 1906, p. 53; and G. Pinard, Montréal, son histoire, son architecture (Montréal: La Presse, 1987), pp. 96-101.

¹⁵⁵ Canadian Cigar and Tobacco Journal, February 1913, p. 59. It should be noted that cigarmaking was not a mechanized trade until the 1920s. Its growth was built upon a highly evolved technical division of labour. Thus, the reference to equipment in the quote probably refers to moulds, a simple piece of wood in which the cigar was shaped.

FIGURE 6.6
LOCATION OF TOBACCO FIRMS, 1890 AND 1916



Source: City of Montreal, Rôle d'évaluation, 1890 and 1916; Lovell, City Directory, 1916; Canadian Cigar and Tobacco Journal, August 1916, pp. 89-95; Harpell, Canadian Industry, Commerce and Finance.

Sons, established in the 1850s, and which like Grothé was to move from Old Montreal to the Outer Core at the turn of the century. In 1884 a fire at his factory in Old Montreal forced Davis to find new manufacturing space. He purchased an old church property and, as Grothé was to do twenty years later, built a seven-storey factory in the Saint-Laurent district, complete with steam elevators, six telephones, and new equipment.¹⁵⁶ In 1895 the Saint-Laurent factory was taken over by American Tobacco Company and Davis moved to a new location in Saint-Ann. Two years later he moved again, this time to the Saint-Antoine district. The five-storey premises there presented the firm with "facilities which were impossible in the old quarters" such as much more space for the 800 workers, a greater segmentation of the different tasks, the chance to "fit the offices with every modern improvement", and to be close to the company's box factory in the Saint-Laurent district.¹⁵⁷ Another fire in 1905 which destroyed this factory enabled the company to seek "larger and more suitable" premises.¹⁵⁸ In 1906 a new factory further west in the Saint-Antoine district had floor space of more than 40,000 square feet and contained the typical requirements of a large-scale cigar factory of the time: an electric goods elevator running from top to bottom and specialization of jobs by floor. What makes the Davis company even more interesting is that the second floor of the building was

¹⁵⁶ Canadian Journal of Commerce, January 18, 1884, p. 76; Commerce of Montreal, pp. 104-105; G. Tulchinsky, "Samuel Davis" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1990), vol. 12, pp. 228-229.

¹⁵⁷ Canadian Cigar and Tobacco Journal, March 1898, p. 69.

¹⁵⁸ Canadian Cigar and Tobacco Journal, January 1906, p. 59.

"entirely shut off from all communications with the other factory [the rest of the building], practically making two factories under one roof."¹⁵⁹ Housed on the second floor was the Cuban department where skilled, immigrant hand rollers made high-priced 'Havanas'. They had to be kept separate from the other 800 workers as they were more able and more likely to strike and make demands upon the company.¹⁶⁰ Accordingly, "[t]he Cuban factory is reached through an entirely separate entrance, a separate staircase being provided for the employees of this branch".¹⁶¹

The two examples of Grothé and Davis illustrate the changing industrial geography of the central zones. By the turn of the century, the importance of Old Montreal for cigar manufacture was on the decline. This was because the expansion of firms, the need to restructure the internal layout of the factory, and the need to introduce new pieces of equipment forced many cigar manufacturers to seek new premises, away from the traditional cigar manufacturing centre of Old Montreal, in districts such as Saint-Antoine and Saint-Laurent. Unlike the tobacco firms of Macdonald, as we saw in Chapter Five, and Imperial Tobacco, as we shall see in the last section of this chapter, the cigar firms did not move to locations too far out from the city core. Instead, they built new premises in the Outer Core where land was cheaper, larger amounts of floor-space was available, and where they still had access

¹⁵⁹ Canadian Cigar and Tobacco Journal, March 1906, p. 65.

¹⁶⁰ The workers in the Cuban department had been such trouble for the company that in 1901 they threatened to move it to Toronto. Canadian Cigar and Tobacco Journal, August 1901, p. 395.

¹⁶¹ Canadian Cigar and Tobacco Journal, March 1906, p. 65.

to transportation facilities and the wholesalers and jobbers of Old Montreal. While Davis and Grothé were the pioneers in the move 'uptown' they were soon to be followed by other cigar firms.

Carriage-making and the Outer Core

While the mobility of firms and industries throughout the central zones was an important element of the core's industrial geography in this period, the Outer Core remained the centre of the city's carriage-making industry, although there had been tremendous changes to the character of the North America industry. Beginning in the 1870s, handicraft production was replaced by economies of scale as the hand-crafted carriage gave way to the machine-made carriage. By 1900 mechanization was so dominant that the blacksmith was the only worker not employing machinery. The primary impetus behind mechanization was the reduction of production time and the minimization of costs: the twinning of labour to the machine was so successful that in the late 1890s the cost of a carriage was almost one-sixth the price of a similar product in 1865.¹⁶²

Despite these changes the Montreal carriage industry remained small in scope in terms of both its total output and the internal scale of firms compared to other North American centres such as Cincinnati and Toronto. Indeed, competition from Ontario was so intense that a Montreal carriage manufacturer was talking of forming

¹⁶² E.P. Duggan, "Machines, markets, and labor: the carriage and wagon industry in late-nineteenth-century Cincinnati", Business History Review, 1977, 51, 3, pp. 309-312.

a local combine to fight it.¹⁶³ The small scale of the industry, however, did not impede the ability of carriage-makers to manufacture a wide range of carriages. At the 1892 World exhibition E.N. Heney displayed nineteen types of carriages including Victorias, landaus, T carts, phaetons, spiders and clarence traps all of which were manufactured at his "extensive factory" on Mignonne street in Saint-Lawrence district.¹⁶⁴

In the last decades of the nineteenth century Montreal's carriage trade grew. From fifty-one establishments employing 349 workers and producing carriages valued at \$345,640 in 1871, the industry had grown to seventy-one firms, 687 workers and \$881,060 worth of output. At the same time, the amount of capital invested in the city's plants expanded. Although no capital figures are given for industries in the 1871 census, the Quebec figure is \$522,015. By 1891 the figure for Montreal alone is \$1,045,617.¹⁶⁵ Although the number of workers and amount of capital invested in firms grew quite rapidly in this period, the city's firms remained small. The city's sixty firms only averaged \$383 in rent, while its median was \$150. The largest firm in 1891, N. and A.C. Lariviere's factory, employed only sixty workers and paid \$2,800

¹⁶³ The Canadian Engineer, September 1894, p. 157.

¹⁶⁴ Canadian Journal of Commerce, September, 1892, p. 493.

¹⁶⁵ The 1871 and 1891 figures come from Canada, Census of Canada, 1871, vol. 3 and Canada, Census of Canada, 1891, vol. 3. The Montreal figures include those from the City of Montreal and Hochelaga County. Although Montreal remained the centre of large-scale carriage making, it did lose companies to other towns. In 1890, for example, the Guarantee Carriage Manufacturing Company was lured from Montreal to Granby by a fifteen year tax exemption and an excellent site (alongside the Central Vermont tracks and hydraulic power). Equally important was that the town's mayor and several "leading men" had subscribed in the company's stock. Montreal Gazette, Friday, October 17, 1890, p. 3.

in rent, while two other firms paid rents of \$1,150 and \$900.¹⁶⁶

Over the period there was little change to the location of the carriage-making industry. As in 1861 a large number of the city's carriage firms (thirty-seven out of sixty) still remained in a thin zone stretching throughout the Outer Core and encircling Old Montreal, while another eight were in the eastern part of Old Montreal next to Saint-Jacques (Figure 6.5). The small-scale character of the individual firms militated against firms seeking more peripheral locations, especially as markets, for the most part, remained centrally located and splintered in terms of carriage types. Reinforcing the central location was the need for a certain type of building structure. Most of the larger firms operated in three to four-storey warehouse buildings where the flow of production could proceed in a continuous manner, and different departments occupied different floors. For example, take Felix Mercier's four-storey carriage factory with a rent of \$900 on Notre Dame street between Bonsecours and Barrack streets. Starting at the top was the wood shop where two separate processes took place, the preparation of pieces of the carriage (panels, framework, gears) and the assembly of the body after the pieces had been seasoned for about ten days. In the blacksmith shop, the body was ironed after it had been assembled. This was followed by the painting, varnishing and trimming of the carriage in the paint and trimming shop. Lastly, there was the final assembly of the

¹⁶⁶ The employment figures given here are taken from the 1891 population manuscripts of the Canadian census which indicate the number of workers an individual employed.

carriage on the first floor.¹⁶⁷ Machinery was used in all of the larger firms. Berard and Major's with twenty-four men made light carriages at their three-storey factory on Sainte-Catherine street "pourvues de machines les plus modernes pour permettre aux hommes de fournir le travail le plus fini possible."¹⁶⁸ Being located in the outer core meant having greater accessibility to the agents and warerooms of the various trimmings manufacturers (leather, wood mouldings, and rubber) that were located in Old Montreal, and the metal shops and saw mills in Saint-Ann in the west and Sainte-Marie in the east. For example, E.N. Heney, as well as having a carriage factory, was an extensive dealer of carriage supplies and was located in the heart of Old Montreal at the corner of Saint-Paul and De Bresoles streets. His 35,000 square feet warehouse was not only a showroom for the carriages made at the Mignonne street factory, but was also a supply house for all types of carriage, harness and saddlery supplies.¹⁶⁹

While manufacturing activities remained rooted to central locations, there was another thread to the industrial geography of Montreal at the end of the century. The process of industry moving to locations other than the city core, that was noticed as early as the 1840s and was firmly in place by 1861, had consolidated by 1890. While the industrial districts created in the spurt of expansion at mid century became increasingly less attractive to manufacturers, new ones, further out from the city core,

¹⁶⁷ The Commerce of Montreal, p. 83. For a fuller description of the production process see Duggan, "Machines, markets, and labor", p. 316.

¹⁶⁸ Huttemeyer, Les intérêts commerciaux, p. 131.

¹⁶⁹ Special Number of the Dominion Illustrated, p. 42.

were being developed. It is to these industrial districts that I now turn.

6.5 The East End: New Manufacturing Forms and New Districts

The growth of manufactories in and around Hochelaga suburb has given some impetus to real estate in that vicinity, and owners have not been slow to plan, map and subdivide in the most attractive manner for purchasers.¹⁷⁰

In Chapter Five it was noted that the industrial development of the East End started from small beginnings in the 1780s and grew slowly in the following 100 years. The 1870s surge of growth firmly established the East End as an important industrial node within Montreal's spatial division of labour. Over the next forty years there was tremendous enlarging of the area's industrial base as the original core - Sainte-Marie - became more elaborate, new additions were made in Hochelaga, and a new industrial district - Maisonneuve - rose to prominence. The purpose of this section is to consider two aspects of the East End's growth in this period: the emergence of a significant cluster of large-scale plants utilizing an array of productive strategies and the development of Maisonneuve as a important shoe-making district.

In 1890, 142 firms - over one-tenth of the city total - were situated in the eastern portion of the city, most of them in the Sainte-Marie district (Table 6.5). The East-End's share of firms and rent, between 1861 and 1890, rose from six to more than ten per cent, and just less than six to over fourteen per cent respectively. Rent structure was still highly polarized, with a high proportion of the zone's firms having

¹⁷⁰ Canadian Journal of Commerce, January 3, 1890, p. 20.

rents of less than \$300, and a large proportion having rents of \$2,000 or more. In other words, the ubiquitous small handicraft and family firm existed next to a few very large firms. The small firms serving the local market included the twenty-three bakeries and confectioneries which ranged in rent from \$30 to \$180. Others such as the nineteen blacksmithing shops and the three beer bottlers supplied local manufacturing establishments. The large firms of 1861 continued to grow: Canadian Rubber in 1890 paid a rent of \$13,700 and employed more than 1,000 workers in their Notre Dame street factory with a four-storey building, 800 by 60 feet, consisting of 200,000 square feet, where the machinery was driven by engines capable of drawing 1,200 horse power (Figure 6.7).¹⁷¹

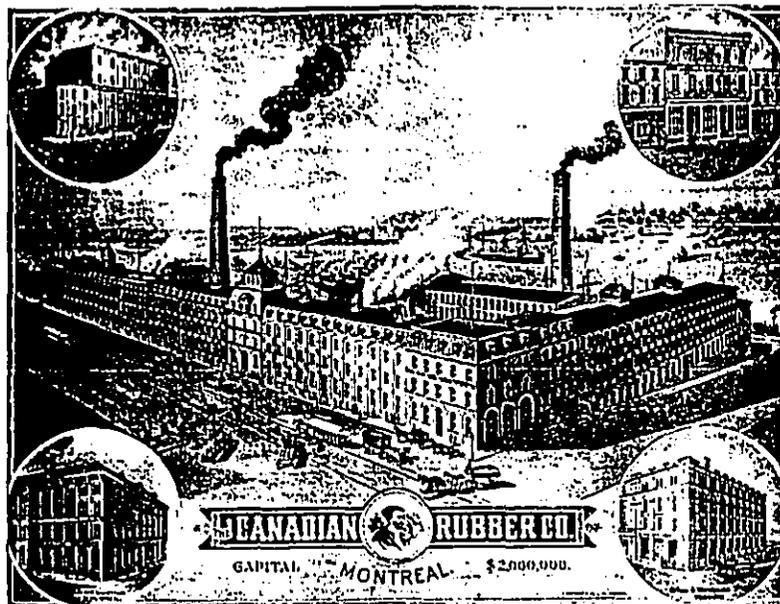
Aside from this building, they have their engine and boiler houses, wash and drying rooms, varnish and cement house, and heaters, also a three-storey repair shop, 40 x 100 feet, in which a large staff of machinists, carpenters, steamfitters, etc., are constantly employed.¹⁷²

A description of rubber shoe manufacture provides some idea of the vast and intricate series of steps involved in the transformation of raw rubber. The making of rubber shoes - the company's main product - consisted of a number of steps: some of the departments are shown in Figure 6.7. After the washing of the crude rubber, the rubber is left to dry for two to three weeks and then sent to the mill room. The mill room was actually two different departments: the first is where the rubber is steamed into a plastic state and vulcanized; the second where the rubber is rolled

¹⁷¹ Souvenir Number of the Montreal Daily Star Reviewing the Various Financial and Commercial Interests Represented in the City of Montreal (Montreal: Henning and Camp, 1890), p. 45; The Dominion Illustrated, December 7, 1889, p. 359.

¹⁷² The Dominion Illustrated, December 7, 1889, p. 359.

FIGURE 6.7
SOME VIEWS OF THE CANADIAN RUBBER COMPANY, 1889



A. The Canadian Rubber Company



B. Some departments of the Canadian Rubber Company

Source: The Dominion Illustrated, December 7, 1889.

into pure sheets or onto either wool or cotton linings. The sheets are then sent to the cutting room where they are cut and passed on the "shoemaker" who cements them together on a last. The shoes are then varnished, loaded onto iron cars and wheeled into the "heaters" where they are transformed from a plastic state to rubber. Lastly, they are taken to the packing room. As one writer says, with echoes of Adam Smith, "a rubber shoe, like a pin, has to pass through a great many hands before finally finding its way into the markets." The manufacture of rubber shoes then was a high-volume, continuous process work format where hundreds of "operatives" minded the belts, rollers, calenders, racks and cars, although some "bottlenecks" like the heating process required the attention of "experts" who had to set and control the heat to acquire the correct degree of material change.¹⁷³ After 1890 the company continued to grow: in 1907 its rent reached \$15,900, in 1912 \$54,000.

New forms of manufacturing and constellations of industry

Alongside the expansion of older firms, the East End became the recipient of a new set of firms from a select group of industries that employed new forms of manufacturing and were attracted by the particular features of the eastern productive space. The Standard Shirt Company Ltd. is an illustration of a firm which came seeking the advantages of a peripheral location in the East End. In 1903 it had offices and a factory on Delorimier street where it employed 1,200 workers. The five-

¹⁷³ The Dominion Illustrated, December 7, 1889, p. 359; Footwear in Canada, March 1913, pp. 103-104..

storey structure, custom-built for the company, had five acres of floor space, and paid a rent of \$7,500 (1907), and the construction of a new building more than doubled that rent by 1912 (\$19,600). The company operated its own power plant with generators for the lighting and electric power. Small electric motors powered even the most difficult part of the clothing production process, the cutting up of the fabric, by operating electric knives. Its policy was

to keep up with the times in the matter of equipment, and a large amount is expended each year in the renewal of plant and installation of machinery specially manufactured and adapted to the needs of the particular departments.¹⁷⁴

Standard Shirt had broken with the agglomeration economies of the core. It no longer had to rely on the intricate linkages which kept other garment makers rooted in the inner city. As one writer stated, "[a]ll the products of the company are made on the premises, and they are not dependent on any one else for any part of their manufacture".¹⁷⁵

Another firm that sought a peripheral location was Colin McArthur's wallpaper factory. A Scot who learned the trade in Glasgow, McArthur moved to Montreal in 1879, and entered business with J.C. Watson at his Montreal Wallpaper Factory in Saint-Ann ward. In 1884 McArthur established his own business in the east end, at the corner of Notre Dame and Voltigeurs. In 1890 he possessed a four-storey plant, 225 feet by 35 feet, with a rent of \$1,500, and fifty employees. In the

¹⁷⁴ Chambers, The Book of Montreal, p. 192.

¹⁷⁵ Chambers, The Book of Montreal, p. 192.

basement were engine rooms, storage for raw stock and manufactured colour. On the first floor could be found the offices, the stock and packing rooms, and the department where skilled workers made the brass pattern rollers for printing patterns on the wallpaper. On the second floor were manufactured the more common wallpapers - "regular", "metallic", and "mica". The company was able to make between 5,000 and 6,000 rolls of regular a day, and, because of the longer drying process, only 2,000 rolls of metallic. These types were made by five printing machines, powered by a twenty-five horsepower engine. While the wallpaper business had in earlier days depended upon imported skilled labour, "improved machinery" had by 1890 replaced hand labour on the common wallpapers. Only for the most expensive wallpapers was hand work lavished: on the top floor, skilled workers were capable of making 100 pieces a day.¹⁷⁶ The firm continued to grow, to 130 workers (1903), and a rent of \$3,500 (1907).¹⁷⁷ The Goad Fire Insurance Atlas of 1915 indicates that new buildings had been added: two new storage sheds, a colour room and a separate two-storey building that housed the company's office and warehouse. The work process of the original building had been reorganized accordingly: the first and second floors were now entirely devoted to colouring, while the upper two floors were for printing.¹⁷⁸ A third example is the Barsalou soap factory. Established around 1875, the company manufactured toilet and laundry soap using a technological process,

¹⁷⁶ W. Atherton, Montreal, 1534-1914 (Montreal: Craig, 1914), pp. 466-469; Commerce of Montreal, pp. 128-129; Huttemeyer, Les intérêts commerciaux, p. 170.

¹⁷⁷ Chambers, The Book of Montreal, p. 226.

¹⁷⁸ Goad, Fire Insurance Atlas, August 1915, vol. 3, plate 106.

which they purchased for \$10,000, that not only reduced the odour of the manufacture of the soap but also greatly reduced manual labour: the new machinery turned out 6,000 pounds of soap, a week's work by hand, in an hour and half.¹⁷⁹

One element of the growth of productive space in the East End was the large-scale firm employing modern machinery from a number of different industries. Another, was the implanting of several constellations of particular industries. Construction of the Canadian Pacific car shops in Hochelaga in 1883 acted as a magnet to firms with either direct linkages or with similar production formats such as a rolling mill, three foundries, a boiler maker, an engine works and two railway supply companies. Around the Hudon mill, which employed 1,275 workers and operated 1,580 looms and more than 65,000 spindles in 1901, we see the emergence of a small textile node primarily made up of large, mechanized firms employing hundreds of workers and catering to a national market.¹⁸⁰ A second large cotton mill (Saint-Ann Spinning) was established in 1882, which in 1890 had a rent of \$4,800, and in 1901 had 417 looms and almost 21,000 spindles operated by 475 workers.¹⁸¹ These two large cotton mills were accompanied by oil cloth (\$2,300), thread (\$1,200), wool (\$2,500) and bedding (\$100) factories. The Dominion Oil Cloth

¹⁷⁹ J. Benoit, "Joseph Barsalou" in Dictionary of Canadian Biography, vol. 12, pp. 62-64. Barsalou is an excellent example of a member of Montreal's bourgeoisie who was involved in a wide spectrum of the city's affairs: real estate through his commission merchant and auctioneering company; other manufacturing firms (Canadian Rubber, Dominion Oil Cloth); finance in the form of the Royal Canadian Insurance Company; and politics through his attempts to become a Montreal councillor, and his long run as mayor of Maisonneuve.

¹⁸⁰ W.R. Houston, Annual Financial Review, 1901 (Toronto: Briggs, 1902).

¹⁸¹ Houston, Annual Financial Review, 1901.

factory on Parthenais street, established in 1872 grew slowly at first, producing floor, table and carriage cloths for the Canadian market, but expanded rapidly at the turn of the century, its land area quadrupled between 1890 and 1907, and its rent grew eight fold (\$2,300 to \$15,800), then to \$26,200 in 1912 (see Figure 6.8). The firm branched out into new product lines, especially linoleum and cork carpet. In 1903 it had a paid up capital of \$500,000 and employed 200 workers, mainly French Canadians.¹⁸² Another textile firm which employed a large number of workers and a large stock of machinery was A.F. Gault's Excelsoir Woollen Mills. Established in 1898, by 1903 it was "among the most complete [mills] of their kind in the country", employed 200 workers and was "equipped with all the most modern and up-to-date machinery for producing the most desirable qualities of worsteds, coatings and the finest class of tweeds".¹⁸³

Among the wholly new enterprises and productive formats of the early twentieth century were two large transportation equipment firms. They gave a tremendous boost to the East End and generated a new type of productive space at a new urban scale.¹⁸⁴ In 1903 Montreal Locomotive and Machine Shop built a plant in Longue Pointe, and the next year the Canadian Pacific Railway completed its new

¹⁸² Chambers, The Book of Montreal, p. 188.

¹⁸³ Chambers, The Book of Montreal, p. 180.

¹⁸⁴ While the impact of these firms upon housing construction in the East End will not be discussed here it should be noted that it was enormous. For example, one writer in reference to the Hudon and Saint-Ann cotton mills exclaimed that "the growth of Hochelaga under the influence of these large manufactories is truly remarkable", while the construction of the Angus shops stimulated a huge land development project in the "Propriété Préfontaine" to the east of the shops in Maisonneuve. See Canadian Journal of Commerce, November 16, 1883, p. 401 and La Patrie, June 26, 1909, p. 11.

shops, the Angus shops. As with the Grand Trunk shops at Point Saint-Charles which when built in the 1850s were the largest manufacturing site in Montreal, the two new car shops in the East End were to play a similar role in the eastern part of the city after 1900. The two differed from existing firms in the East End in terms of size, the layout of their plant, and the logic of the production process, while providing the model for other companies such as Canada Cement and Imperial Oil, that were to be built on the eastern edge of the city in later years.

Montreal Locomotive built one hundred locomotives in its first year of operations and ultimately expanded to a capacity of three hundred a year. The plant, with capital of \$1,000,000 and the installation of machine tools worth \$300,000, was designed to manufacture machines as well as structural work - steel buildings, bridges and roof trusses. It started off as a Canadian financed firm, but in early 1904 it was bought out by the American Locomotive Company who wanted an entry into the Canadian market because with "the duty against them they were unable to do any large amount of business with Canada."¹⁸⁵ Like other consolidated transportation equipment manufacturers, American Locomotive was seeking to capture the growing global market¹⁸⁶, and Montreal was the perfect location for access to the Canadian railway companies.

Montreal Locomotive was established as one of the largest firms in Montreal and had a rent of \$75,000 and covered seventy-four arpents (or twenty-five hectares)

¹⁸⁵ The Canadian Engineer, April, 1903, p. 110, November 1903, pp. 314-316; Canadian Manufacturer, March 1904.

¹⁸⁶ Chandler, The Visible Hand, p. 359.

in 1912. Its layout and the amount of capital sunk into machines and equipment were impressive. Table 6.6 shows the dimensions of shops and equipment at the end of 1903. As the riverside site was important for such heavy work the company built its own wharf and pier. To ensure a good negotiating position for the best price in electric power, they built their own power plant and bought only "surplus power" from the Montreal Light Heat and Power Company.

Even larger were the Angus shops in the northern reaches of the East End. Their creation involved twin projects - creation of a new industrial space and the complete renewal of a productive space twenty years old. The Hochelaga shops, built in 1883, on Delorimier street for the manufacture and repairs of freight and passenger cars and locomotives had become inadequate as the Canadian Pacific demand for rolling stock increased, and encircled by factories and housing, they could not expand. When the Angus shops were opened in 1904, Canadian Pacific closed down the Hochelaga shops and parcelled the land into factories and warehouses: Carter White Lead, with a rent of \$3,500 in 1905, Deering (\$2,500), Metal Shingle and Siding Company (\$2,000), Canada Stove (\$1,800), and Canadian Bronze (\$1,800). With a 260 acre site the new shops differed from earlier firms in their generous use of land. They were part of a railway system that was "well inserted in the urban texture of Montreal through a dozen installations that responded to precise criteria of division of labour and operational efficiency."¹⁸⁷

¹⁸⁷ B. Ramirez, "Brief encounters: Italian immigrant workers and the CPR, 1900-1930", Labour/Le Travail, 17, 1986, pp. 11-13. A brief description of the Canadian Pacific Montreal system can be found in The Canadian Engineer, September 1915, pp. 403-404.

TABLE 6.6
INVENTORY OF THE SHOPS OF THE MONTREAL
LOCOMOTIVE AND MACHINE CO., 1903

SHOPS	A	
	DIMENSIONS	MACHINERY & EQUIPMENT
Machine	420 by 132	- 1 10-ton electric travelling crane - 26 jib cranes
Foundry	220 by 65	- 1 15-ton crane - steel pressure blower
Boiler	380 by 67	- 1 20-ton electric travelling crane - hydraulic accumulator
Erecting	340 by 60	- 2 sets of standard gauge tracks - 2 6-ton electric travelling cranes
Smith & Forge	340 by 66	- number of air-hoist jib cranes
Pattern	109 by 63	
Power House	105 by 71	- 4 250-hp boilers - 1 Corliss compound condensing engine - 400-KW direct current generator - 2 air compressors

B
OTHER MACHINERY & EQUIPMENT USED THROUGHOUT THE SHOPS

electric motors:	100 (from 5 to 60 hp)
lathes:	Draper crank-pin; double head axle turning; tripled geared engine; wheel turning; wheel.
planes:	48 inch iron; Pond.
screwing:	staybolt; bolt.
other:	vertical miller; boring and turning mill; slotting machines; car wheel boring machine; traverse head shapers; hydraulic wheel presses; frame slotting machines; boiler plate bending machines; heading and forging machines.

Source: Canadian Engineer, November 1903, pp. 314-316.

The purpose of the Angus shops was the maintenance, repair and construction of rolling stock for the Canadian Pacific national system, and there was a separate building for the manufacture of switches, frogs and sundry other railway supplies.¹⁸⁸ In its first ten years, the Angus shops turned out more than 79,000 freight wagons, 2,000 passenger cars, and 1,300 locomotives, half of them being made for the company itself.¹⁸⁹ The layout on the ground reflects the vertical integration of Canadian Pacific manufacturing: the plant was made up of three sets of workshops. The first was comprised of freight and passenger car shops, a planing mill, cabinet shop, truck shops, car machine shops, wheel foundry and dry kilns. The second set included a machine shop, erecting and blacksmithing shops; and the third set of buildings - a smithy and a grey iron foundry - supplied materials for all the shops. These various buildings were laid out to expedite the flow of materials. "The main point to be considered in the arrangement was, ..., the economical and direct handling of the material from the raw state to its incorporation into the finished car or engine".¹⁹⁰

The layout of the plant and its integrated manufacture were matched with a new set of productive relations. The new relations of production are most apparent with the implementation of scientific managerial methods of production control after 1907. Rationalization was stimulated by the increased demand for rolling stock, the

¹⁸⁸ The Canadian Engineer, March 1904, pp. 72-73.

¹⁸⁹ R. Naheut, "Une expérience canadienne de taylorisme: le cas des usines Angus du Canadien Pacifique" (Maîtrise en histoire, l'Université du Québec à Montréal, 1984), Tables XII and XIII, p. 59.

¹⁹⁰ The Canadian Engineer, March 1904, p. 73.

need to decrease costs and a strike in 1908. To cope with these pressures, management sought to speed up production, and ensure control of labour. The older forms of labour control and methods for speeding up production were proving to be inadequate for the vast, sprawling shops that contained forty departments. In 1908, the American expert on factory rationalization, Henry Gantt made an extensive study of the shops and came up with two principal recommendations. The first called for greater coordination and a more efficient integration of the various parts of the plant. To that end, Canadian Pacific established a central planning office to coordinate the flow of materials between and within departments. Gantt's second recommendation was reorganization of the production process by means of "instruction cards" to assign tasks, specifying the manner in which production would proceed and the time required to execute a job. This gave management the ability to assess more precisely the value of piece work and to find new ways of speeding up production.¹⁹¹ Productive practices were transformed, and in 1913 the shops were enlarged and reorganized in such a way as to "reduce labor to a minimum."

The equipment of each and all of these buildings, and the shop methods, even including the fire and police protection, the courses of instruction to the apprentices, the dining hall, library and recreation facilities are all matters that have been worked out to a scientific and sound business basis.¹⁹²

There was "very systematic routing of material and of operations", and "a decided

¹⁹¹ Naheut, "Une expérience canadienne de taylorisme", chap. 3.

¹⁹² The Canadian Engineer, January 21, 1915, pp. 176, 174.

uniformity in the arrangement of machinery".¹⁹³ The acid test was, of course, the reduction of costs. In the years following the introduction of Gantt's recommendations the number of days that it took to construct a locomotive was reduced from eighteen to fourteen.¹⁹⁴

Maisonneuve and the restructuring of the shoe industry

Another perspective on the making of productive space in Montreal's East End before World War I can be found through a discussion of the development of Maisonneuve, "The Pittsburgh of Canada".¹⁹⁵ Maisonneuve provides an excellent example of the intersection of state, land development and manufacturing interests in the making of a productive space. The rise of Maisonneuve to industrial prominence was based upon two pillars: a systematic industrial policy to attract firms and the creation of a "model" working-class district. Intimately involved in both were a set of individuals who, taking advantage of the growing need for new industrial space associated with the boom after 1896, integrated land and industrial capital within the sphere of state control.

A cornerstone of Maisonneuve's growth was a systematic policy of industrial growth based on the implementation of municipal subsidies in the form of tax concessions and cash grants, and the installation of infrastructures. From the town's

¹⁹³ The Canadian Engineer, September 2, 1915, p. 329.

¹⁹⁴ Nahcut, "Une expérience canadienne de taylorisme", p. 87.

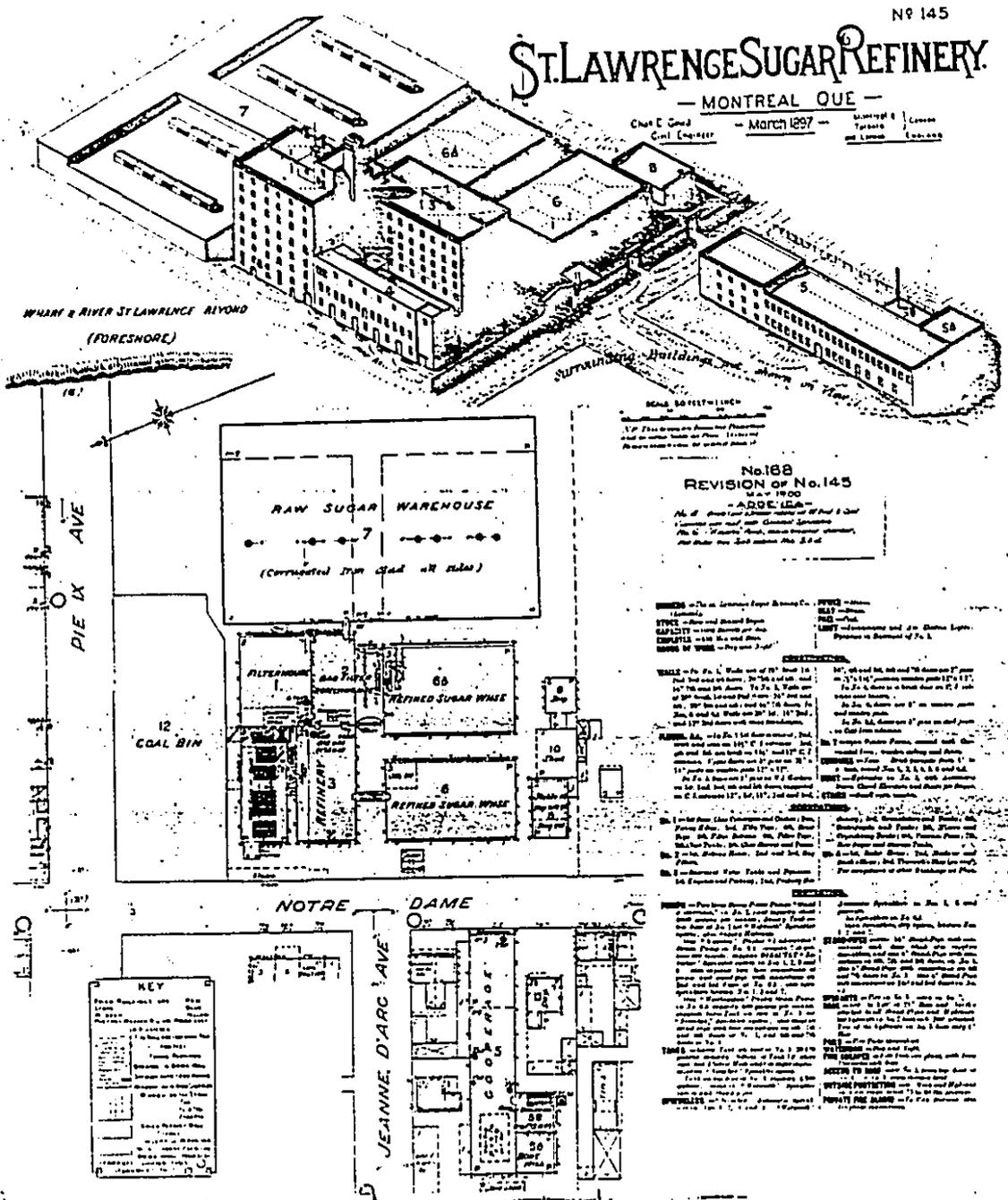
¹⁹⁵ This section draws heavily upon Linteau, The Promoters' City.

incorporation in 1883 the municipal council attracted manufacturers, many from Montreal, to Maisonneuve. The first firm to take advantage of this was the St. Lawrence Sugar Co. in 1887 after a fire had destroyed its original plant in Saint-Ann ward. Locating on both sides of Notre Dame street alongside the river, the Sutherland Pier and the Harbour Commissioners railway line, it received a twenty-year tax exemption and a right-of-way for a railway line. As Figure 6.9 shows in 1900 it covered more than two blocks with the main refinery being eight-storeys high. The first strong wave of growth occurred between 1894 and 1900 when the town provided ten firms with exemptions worth more than \$83,000.¹⁹⁶ After a quiet period in the first years of the new century, another boom took place with eighteen companies moving to Maisonneuve with subsidies. While the town granted tax exemptions and cash grants, manufacturers were under certain obligations as well, usually some combination of the employment of a certain number of workers, the provision of a certain amount of wages, and the construction of a building of a designated value. The town was also active in the the building of important infrastructures such as transport networks (trolley, railways and harbour facilities), electric street lighting, and a water system, having spent more than \$1.5 million on *canaux, terrassement*, and *macadamisage* by 1908.¹⁹⁷ As Linteau states, Maisonneuve council's dealings with the utilities, "illustrate the close co-operation that existed between civic leaders and

¹⁹⁶ Linteau, The Promoters' City, pp. 55-57, 69-85.

¹⁹⁷ J-P. Gauthier and P. Larivière, "La Cité de Maisonneuve. Ville modèle du début du siècle" in Société historique de Montréal, Montréal: Artisans, histoire, Patrimoine (Montréal: Fides, 1979), pp. 104-106; La Patrie, June 26, 1909, p. 5; Linteau, The Promoters' City, pp. 65-69, 86-104.

FIGURE 6.9
PLAN OF THE ST. LAWRENCE SUGAR REFINERY, 1900



Source: C.E. Goad, St. Lawrence Sugar Refinery, Montreal, Quebec (Montreal: Goad, 1900), Survey No. 168 (Revision of No. 145, 1897).

representatives of industry. They were elements in a coherent industrial policy worked out fairly early in Maisonneuve's history".¹⁹⁸ In conjunction with this "close co-operation" between council, utilities and manufacturers was the systematic creation of a working-class district. From the very beginning, large landowners controlled large tracts of land and were extremely influential on the city council. Eight families were assessed for more than \$162,000 (or seventy-two percent) of the town's property value according to the first assesment in 1884, while with the exception of two years there was always a representative of the large landowners on the town council¹⁹⁹

Critical to the success of the town's industrial policy was the development of a labour force. Accordingly land was subdivided and sold by the large landowners to small builders and building companies who, in the Montreal style, built relatively cheap, two and three-storey row housing. While the provision of essential services was not as good as in bourgeois suburbs such as Westmount and Outremont, Maisonneuve's were of high quality by Montreal standards.²⁰⁰ Imbricated in the landowners' control of the direction of Maisonneuve's growth through the promotion of industry was that they were to reap the profits from the full-scale development of working-class housing. The incentives granted to manufacturers then were a way for

¹⁹⁸ Linteau, The Promoters' City, p. 77.

¹⁹⁹ Linteau, The Promoters' City, pp. 22, 31.

²⁰⁰ For Maisonneuve see Linteau, The Promoters' City, chaps. 2, 3, and 6. For the other parts of the city see H.B. Ames, The City below the Hill (Toronto: University of Toronto Press, 1972); Collin, "La Cité sur mesure"; Copp, Anatomy of Poverty, chaps. 5-6.

land capital to cream substantial benefits.

Given the complex set of inter-connections between the political elite, land capital, utilities and manufacturers, growth of the town's industrial base occurred rapidly. From a small set of firms in 1890 (St. Lawrence Sugar and few workshops supplying the local market), in 1918 there were fifty-two paying a total annual rent of more than \$300,000, with some, such as Vickers and St. Lawrence Sugar, being amongst the largest in the city at the time. (Table 6.7). While the externalities that were to be found in Maisonneuve were of obvious importance to the building-up of a large industrial base in Maisonneuve, we also need to consider the internal dynamics driving firms to seek new work sites. Linteau attributes the expansion of the town's industrial base to the availability of large tracts of land, loose municipal supervision of factories, the provision of subsidies and an excellent infrastructure all functioning within the active promotion of the town by its elite.²⁰¹ This form of explanation falls prey to some obvious questions. Why did firms move at this particular time? Why did industrialization occur in the suburbs in this period? Why did a particular array of firms settle in Maisonneuve? To address these questions a brief analysis of Maisonneuve's shoe industry will be presented.²⁰² From having no shoe factories before 1898, by the end of the first decade of the twentieth century,

²⁰¹ The Promoters' City, pp. 55, 69.

²⁰² I will not present a discussion of the development of Montreal's shoe industry. This has been examined by Burgess, "La industrie de la chaussure" and J. Ferland, "Évolution des rapports sociaux dans l'industrie canadienne du cuir du tournant du 20e siècle", (Ph.D thesis, McGill University, 1985). The aim here is to analyse some of the key dynamics responsible for the growth of Maisonneuve as an important shoe centre.

TABLE 6.7
MAISONNEUVE'S INDUSTRY, 1918

A
Manufacturing Firms By Sector

	No of Firms	Rent
Ship yards	1	78,000
Metal Working	8	70,600
Food	10	62,810
Shoe	11	40,500
Textile	2	27,600
Paper	2	13,900
Chemical	3	6,270
Wood	2	1,900
Blacksmithing	4	880
Printing	2	720
Tobacco	3	690
Other	4	2,150
Total	52	306,020

B
Largest Firms

	Rent	Value of Land and Building
Vickers Ship Yard	78,000	1,581,000
St. Lawrence Sugar	45,000	1,003,000
Spool Cotton	26,000	-
United Shoe Machinery	25,000	554,000
American Can	22,500	440,000
Warden King Foundry	15,000	316,000
Viau Biscuit	13,150	314,000
Watson Foster Wallpaper	12,100	232,000

Source: City of Montreal, Rôle d'évaluation, 1918 Mercier ward.

Maisonneuve had become one of the most important shoe-making districts in Canada. In 1911 it had eight factories where 1,400 workers produced shoes to the value of almost \$2.5 million.²⁰³ Three dimensions of the Montreal shoe industry between 1880 and 1920 can be summoned to help explain the movement of shoe firms to Maisonneuve.

By the 1880s Montreal's shoe manufacturers were struggling with intense competition. As one writer exclaimed in 1885, "competition has been keen, and the natural result - cut prices - has brought with it lessened profits and consequent dissatisfaction."²⁰⁴ Things did not get much better over the ensuing years as competition intensified as a result of cheaper methods of production and the cutting of prices leading to a large number of failures in the 1890s.²⁰⁵ Over the next twenty years, despite the signs of growth (increasing capitalization, number of workers, and value of produce), competition remained intense and the ability to stay in business meant that shoe manufacturers had to get involved in "scientific management" which meant that they had to have "a knowledge of the whole business [that] ... enables the manager to set down in figures just what [will be] the cost of his material, labor, supervising force, insurance, rent, machinery, heat, fuel, light, etc."²⁰⁶ Throughout the period, however, manufacturers were still complaining about the costs of the

²⁰³ Canada, Census of Canada 1911, vol. 3, Table 9, pp. 302-303.

²⁰⁴ Canadian Journal of Commerce, January 16, 1885, pp. 86-87.

²⁰⁵ Montreal Gazette, February 5, 1890, p. 8; Canadian Reconstruction Association, The Boot and Shoe Industry (Toronto: np, 1920), pp. 5, 10.

²⁰⁶ Footwear in Canada, April 1912, p. 27.

industry. In one estimate the cost of materials (this presumably includes raw materials and labour) represented more than eighty per cent of net sales, leaving very little for overhead expenses and an adequate return on capital investment.²⁰⁷ In 1915 an industry journal stated that ninety-four per cent of the total value of manufactured goods went to raw materials, labour, overheads and miscellaneous costs.²⁰⁸ The squeeze on profits was endemic to the industry. Although the industry was greatly mechanized by the 1880s, a number of factors ensured that large-scale manufacturers were unable to use technology to gain significant control of the industry.

In the first place, as we have already seen in Chapter Five with reference to other industries, the small market was an obstacle for Canadian manufacturers to achieve the types of economies of scale common in American shoe factories. As one of the leading Quebec City manufacturers stated, in the United States "business is ... conducted on a much larger scale, several firms having each an output equal to the whole manufacturing trade of the Dominion."²⁰⁹ Canada was a "slaughter yard for American goods" as American manufacturers could run for a long period on one style, while their Canadian counterparts, "had to change round to several lines a day."²¹⁰ When the cost and inconvenience of the wide range of styles - in the 1910s

²⁰⁷ Canadian Reconstruction, The Boot and Shoe Industry, p. 5.

²⁰⁸ Canadian Shoe and Leather Journal, June 15, 1912, p. 50.

²⁰⁹ John Ritchie of J. Ritchie Co. in the Canadian Shoe and Leather Journal, May 1, 1913, p. 63. This fact was also pointed out in the Canadian Reconstruction, The Boot and Shoe Industry, p. 7.

²¹⁰ Montreal Gazette, February 5, 1890, p. 8.

a retailer could carry anywhere between 700 to 800 samples - was added alongside the small capacity of Canadian firms the result was that costs could not be reduced to compete either in the domestic market or against foreign manufacturers. Ritchie continued,

Owing to the fact that the American shoe trade is so specialized, they can produce cheaper than we can. While the earning power of labor is probably about equal on both sides of the line, specializing makes labor more productive and more efficient, therefore they can produce cheaper and give a better finish than we can at present.²¹¹

Furthermore, while mechanization could lead to dominance by a few firms in some industries, in the shoe industry it had the effect of providing budding new manufacturers with a wide range of techniques to choose from.

Boots and shoes could be sewed, cemented or nailed; they could be assembled according to different patented alternatives. They could be buttoned or laced, and, of course, further distinguished on the basis of gender, age groups, class, and different practical purposes.²¹²

The industry was also an easy one to enter. One commentator stated that a prospective manufacturer,

with one or two thousand dollars - enough, say, to pay wages for a week or two - he rents ample premises, buys his machinery on credit, his leather at six months, and, with his travellers on the road, soon obtains paper enough to make him a respectable account at some bank.²¹³

²¹¹ Canadian Shoe and Leather Journal, May 1, 1913, p. 63.

²¹² Ferland, "In search of the unbound Prometheus", p. 23.

²¹³ Canadian Journal of Commerce, August 31, 1883, pp. 47-48. The renting and credit practices of the United Shoe Machinery Co. provided new and small manufacturers with ample opportunity to start up. See J. Ferland, "'Not for sale' - American technology and Canadian shoe factories: the United Shoe Machinery Company of Canada, 1899-1912", American Review of Canadian Studies, 1988, 18, 1, pp. 59-82; H.E. Watson, "Canada's Sixth Industry", The Canadian Magazine of Politics, Science, Art and Literature,

Nonetheless, despite this fragmentation and a powerful dynamic generating a significant number of small firms, there was a movement to concentration and consolidation. In 1916 while the average Canadian factory produced a daily output of 350 pairs of shoes, thirteen manufacturers produced more than 1,000 pairs daily while the largest - Ames, Holden and McCready - produced upwards of 4,000.²¹⁴ In other words, the industry was characterized by a variety of firms, of different scales, using an array of different techniques and production methods.

A second feature of the changes occurring after 1880 which affected the locational capabilities of the shoe industry was increasing specialization. One of the major problems confronting the industry was the multiplication of styles which meant that manufacturers had to constantly be up with fashion changes, continually resetting machinery, and incurring large expenditures as lasts quickly became obsolete.²¹⁵ Shoe manufacturers traditionally had made a wide variety of shoes, but by the 1890s they were beginning to specialize.

Factories formerly producing all classes of shoes from the fine ladies' to the coarse stoga, now devote ... their whole attention to one particular line, ... Probably the best result accomplished by this single line method was the production at the minimum cost of shoes of a maximum quality in their respective lines.²¹⁶

After the 1880s manufacturers could no longer depend upon technological

1911, pp. 33-40.

²¹⁴ Canadian Reconstruction, The Boot and Shoe Industry, p. 7.

²¹⁵ Canadian Shoe and Leather Journal, August 15, 1912, pp. 39-40.

²¹⁶ Canada, Leather Boot and Shoe Industry, 1921 (Ottawa: Minister of Trade and Commerce, 1923), p. 5.

inventiveness or control over a patent as the means to make their way in the industry. As one writer comments, "new inventions and mechanical improvements were constantly appearing but they did not create new types of footwear or modify profoundly the division of labour and the division of operations in the manufacturing process".²¹⁷ Manufacturers were caught in the bind of decreasing prices and increasing costs, forcing them to go into standard lines or to specialize in a particular line (mens, womens, childrens, working, slippers) or a particular technique (McKay, welt, turns, stitchdown pegged or screws) By the end of World War I, despite the small extent of the market, the Quebec industry was "fairly well specialized. There are only one or two factories now making a complete line of footwear and in them the different processes are carried on in entirely separate departments". In Montreal, three factories specialized in men's goods, six were devoted to women's lines, and sixteen concentrated exclusively on children's shoes. Likewise, thirteen firms used only the McKay process, four the welt, while turns were used exclusively in three.²¹⁸

A third dimension that lay behind the spatial changes occurring to the Montreal industry was the growing insurgency of the shoe workers. From the beginning of the transition of shoe production from craft production to the factory system, Montreal shoe workers had fought to maintain some control over working conditions and the labour process. In the 1860s, when the shoe makers struggles were

²¹⁷ V.S. Clark, History of Manufactures in the United States (New York: Peter Smith, 1949), vol. 3, p. 230.

²¹⁸ "The progress of the shoe manufacturing industry in the Province of Quebec", Footwear in Canada, February 1912, p. 42.

spearheaded by skilled workers in the form of craft unions, the major concern was the ending of sub-contracting. By the turn of the century, the shoe industry had become more broad-based and labour conflicts "were more widespread occupationally".²¹⁹ Contributing to the development of worker solidarity was the increased fragmentation of the labour process and the continued deskilling of workers: by 1900 the only 'skilled' workers in the industry were leather cutters who, like the printers, maintained their skill and status despite mechanization through control of materials and machinery.²²⁰ The very forces that were operating in the competitive structure of the industry were also leading to growing tensions within the workplace and to increased forms of struggle.²²¹

The impact that these changes were to have upon manufacturers was to force them to seek new strategies to increase profits and gain a favourable share of the market. There were several options open to them. One, as we have seen, was to specialize in a particular niche of the market. Manufacturers could also cut down on the quality of their raw materials, integrate horizontally and vertically, introduce new machinery (the Goodyear machinery, for example, was introduced in the late 1880s and had a tremendous impact on the industry), replace steam power with electricity

²¹⁹ Ferland, "In search of the unbound Prometheus", p. 33. A list of several strikes can be found in Hamelin et al., Répertoire des grèves.

²²⁰ Ferland, "Syndicalisme 'parcellaire' et syndicalisme 'collectif'", pp. 55-64.

²²¹ A similar chain of events occurred in Quebec City where the "gravest" of problems for manufacturers were the labour unions who had "constituted themselves the supreme rulers and arbiters" of the factory. The result was that some of the city's firms were moving to other shoe centres; one of them - James Muir and Co. - moved to Maisonneuve in 1913. See Canadian Shoe and Leather Journal, November 1910, pp. 52-53.

or intensify the exploitation of labour (through longer hours, decreasing piece rates, or speeding up production).²²² A strategy open to a few firms was to cut costs and restructure the work place through spatial relocation. This choice, however, was only available to a select group of Montreal shoe firms. Firms that were already big in scale and had large fixed investments or had committed large chunks of capital to new, unvalorized machinery, or small firms that were dependent upon centrally-located jobbers and wholesalers found it difficult to leave the tight cluster of the city core. There were some firms that were not tied down by these restrictions. The place that most of these more free-wheeling firms choose to relocate was Maisonneuve.

The question remains, why Maisonneuve? It had to do partly with the town's attractions - land, utilities, and a pliable town council. But other industrial suburbs also had the same benefits. It could be argued that the west-end industrial suburb of Saint-Henri was a stronger case as it had historically been an important leather-working village.²²³ But this was the point - manufacturers chose Maisonneuve as an attempt, not only to cut down costs, but to escape the confines of the past through the making of new productive spaces. At the turn of the century firms, propelled by the pressures plaguing the industry, sought to construct a new work environment, one that was tied to reducing costs, and at the same time within a reasonable distance of the shoe industry cluster in Montreal. The conjunction of the

²²² For some examples of these strategies see Footwear in Canada, October 1912, p. 53, December 1912, p. 53, April 1913, p. 57; Canadian Shoe and Leather Journal, June 1915, p. 27.

²²³ J. Burgess, "Work, family and community: Montreal leather craftsmen, 1790-1831"; C. Ouellet, "Les industries du cuir à St-Henri" (Unpublished paper, Université Québec à Montréal, 1981).

development of Maisonneuve (and the services it provided) and the changes taking place within the shoe industry led to the town's importance as a shoe-making centre.²²⁴

They are several pieces of evidence that confirm this idea. First, the shoe manufacturers made close links with Maisonneuve's land developers and were active upon the town council. Many manufacturers also became residents of the town and soon integrated their way into its everyday life. As Linteau states, "they made their presence felt in town, school and parish institutions".²²⁵ In other words, shoe manufacturers moved from Montreal and quickly acquired an important foothold in local bourgeois circles, using their power as a means to shape the town's political and social milieu as well as a mechanism for creating a more favourable environment to generate profits.

To do this, shoe manufacturers were able to construct a new set of buildings where new machinery could be installed, new lines established, and different techniques introduced. One example is that of Dufresne and Locke who started in a small way (under the name Pellerin and Dufresne) in 1890 on Craig street in the heart of the Montreal shoe-making district. After a move in 1893 to a new plant a little north (Vitre street) they soon understood the limitations of the central core.

²²⁴ Maisonneuve's position within the shoe industry was helped by the advertisements that the town took out in the industry's journals. For example, one showed pictures of the town's schools ("schools for the workman's children"), shops ("shops for the workman's convenience"), parks ("parks for the workman's family") and a detached bungalow ("the workman's pride"). See Canadian Shoe and Leather Journal, January 15, 1913, p. 28.

²²⁵ The Promoters' City, p. 82.

After looking around they decided to move to Maisonneuve, which although at the time "little known to manufacturers ... appealed to Messrs. Dufresne and Locke". In 1900 they moved into their new building which was five times the size of their Vitre street plant where they concentrated on making McKays and turns. They grew quickly. By 1904 they employed 125 workers and by 1912 their 350 employees worked in a building that was four times the size of the original one.²²⁶ Another case is that of Dupont and Frere which built a "splendid new factory" in Maisonneuve in 1910. The old factory in Montreal had "gradually been growing more and more inadequate" and the need for new premises became "an absolute necessity." They built a typical four-storey mill structure which provided three times the output of the old factory. With the move they introduced "improved machinery" and the result was "better work is being done in every department." Like other Montreal firms, the Kirvan-Doig Co. saw Maisonneuve as a place to restructure their operations. In 1912 they moved from their old Montcalm street plant to a new three-storey factory on Desjardin street where new and a much greater amount of machinery had been installed which "is so arranged that it makes a progressive operation all around."²²⁷ Such was the success of the firms that moved to Maisonneuve that once they had been established in their respective specialization they branched out into new lines: in 1910 Dufresne and Locke added Goodyears to their staple line of turns; Dupont and Frere in 1915

²²⁶ Footwear in Canada, July 1912, p. 41; Ville de Maisonneuve, Rôle d'évaluation, 1904 and 1912.

²²⁷ Canadian Shoe and Leather Journal, 1912, #20, p. 55; Footwear in Canada, 1912, #2, p. 46 and #8, p. 61. The move to Maisonneuve was too late to save the company. In 1913 it failed and its new building was taken over by Dufresne and Locke. See Canadian Shoe and Leather Journal, #11, p. 52 and 1913, #16, p. 57.

added men's Goodyear welts to their speciality of medium-priced women's McKays; the Rideau Shoe Co., after buying out the Laniel and Co. factory in 1908, converted output from cheap turns and McKays to high-grade men's shoes.²²⁸

By 1918 the eastern periphery of the city had developed into a series of productive spaces: the original Sainte-Marie section had expanded considerably; the large railway car shops created distinct industrial nodes; and Maisonneuve had become one of the most important industrial suburbs in Canada. As I show in the next section, a similar train of events was taking place in the West End such as the intensification of existing industrial areas and the development of new ones further out from the core.

6.6 The West End: Industrial Restructuring and the Making of Industrial Spaces

Fergusson, Alexander and Co ... are making extensive alterations and additions to their central lead, color and varnish factory on College street. Every inch of space is being utilized to make room for additional plant and machinery. As an 'overflow', the firm have leased buildings and a plot of ground near St. Gabriel Locks in the suburbs which will assist, when necessary, in relieving the congestion at their city works.²²⁹

As the example of Fergusson illustrates industrial expansion and intensification continued in the West End. Its role as a major recipient of technology was maintained as the area alongside the Lachine canal retained many of its earlier firms and new ones were established. Its manufacturing rents continued to be much

²²⁸ Footwear in Canada, July 1907, p. 41; Canadian Shoe and Leather Journal, April 1910, p. 86, November 1910, pp. 101, 103, July 1915, p. 46

²²⁹ Canadian Journal of Commerce, November 1889, p. 772b.

higher than for the city as a whole (a mean of \$959 and a median of \$240), especially the Lachine district (with a mean of \$1,364) which retained its prominence as the focus for the large-scale growth industries of the mid-nineteenth century. Griffintown remained the metal fabricating centre of Montreal, with medium-sized, proprietary firms. A new feature was the development of a large industrial complex farther to the west in the municipalities of Saint-Henri, Sainte-Cunégonde, and Côte Saint-Paul which will be the focus of this section: by 1890 that district contained more than six per cent of all the city's firms and almost eleven per cent of its business rent.

In 1890 the Grand Trunk shops were still the largest manufacturing establishment in the city, large flour, nail and sugar factories towered over the canal, Mill street remained a node of capital-intensive plants, and Griffintown continued to be the kernel of metal fabricating, with important tobacco wood and food enterprises on a smaller scale. Consolidation of firms refashioned industrial space. Developments in electrical and chemical industries were instrumental in transforming the character of the productive spaces and social practices.

While these developments made possible an absolute increase in the numbers of firms, and rents rose in the Lachine and Griffintown districts, their relative shares, as with Old Montreal, declined.²³⁰ The changes signify the beginnings of a decline in the importance of these districts for food processing and metal, and with the development of new productive spaces in other parts of the city, the strength and

²³⁰ For example, Lachine's share of firms fell from just over six per cent in 1861 to five per cent in 1890, rents from twenty-six per cent to twelve per cent.

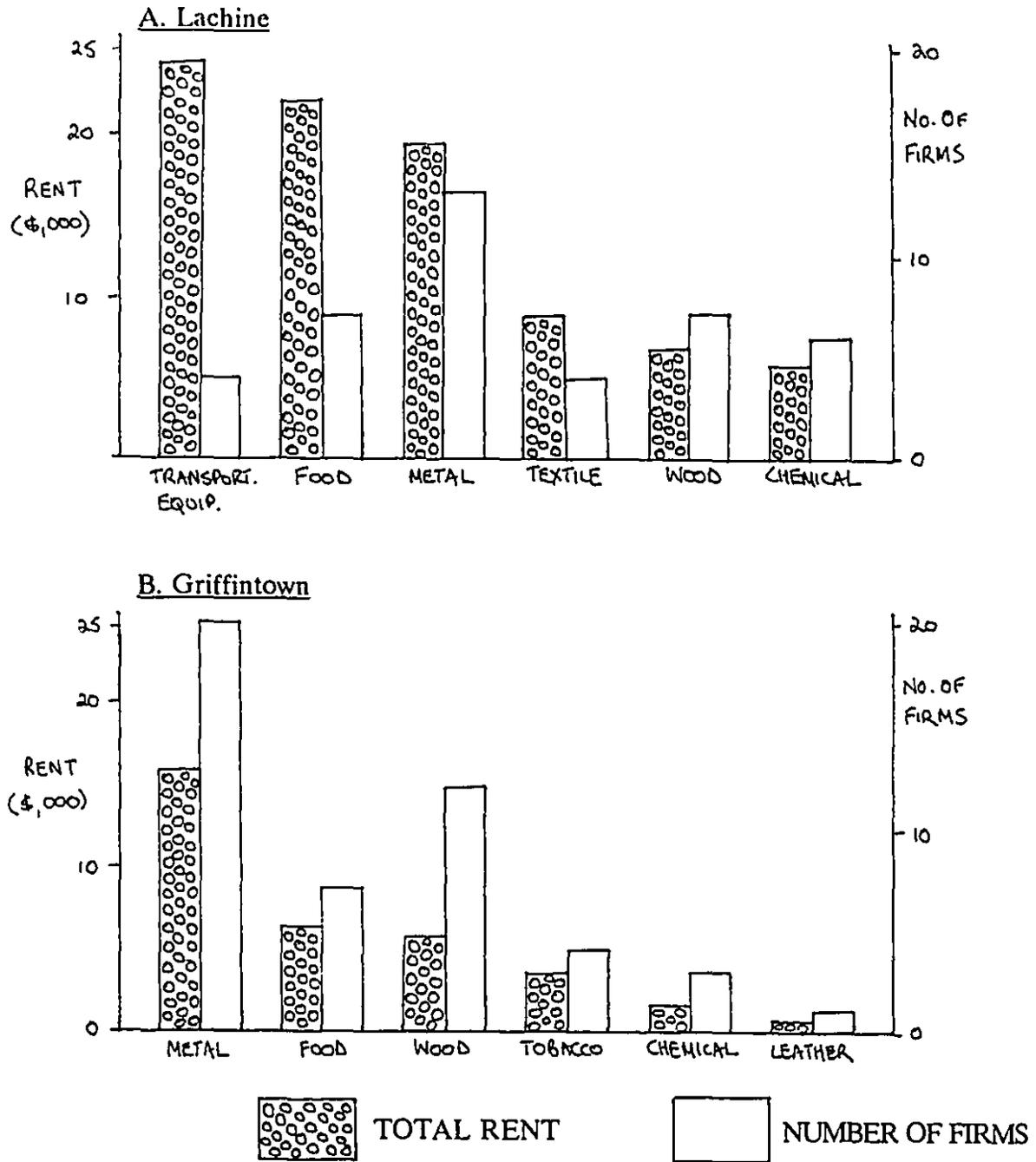
vitality of the older districts would be slowly undermined. By 1929 they would only account for little over twelve per cent of the city's rent while in 1861 they accounted for more than a third. Nonetheless, in 1890 the West End was still the core of a number of the city's important industries. Figure 6.10 shows that the leading sectors of the Lachine and Griffintown districts were similar to those of thirty years earlier: metal, food, chemical and wood products remained important. This was an industrial structure quite different from other parts of Montreal, especially Old Montreal and the Outer Core where clothing, leather and printing firms dominated. The West End also had a high proportion of the city's rent in the metal (60 per cent), transportation (60 per cent), food (48 per cent), textile (46 per cent) and chemical (43 per cent) sectors.

The restructuring of the flour industry

The restructuring of the older districts is foreshadowed in the microgeography of the flour milling industry. The role of Montreal in the export of wheat goes back to the beginnings of the nineteenth century. Until the 1840s, while Montreal was a centre for the export of wheat, "the milling of flour had been conducted on a relatively small and decentralized basis throughout the seigneuries of Lower Canada and the townships of the Upper province".²³¹ The enlargement of the Lachine canal in the 1840s provided some nascent flour millers with access to the wheat that passed along the Lachine canal to export markets and to the hydraulic power that would

²³¹ Willis, The Process of Hydraulic Industrialization, p. 343.

FIGURE 6.10
LEADING SECTORS IN LACHINE AND GRIFFINTOWN
BY TOTAL RENT AND NUMBER OF FIRMS, 1890



Source: City of Montreal, *Rôle d'évaluation*, 1890

operate the mills. Construction of the four big flour mills in the 1840s and 1850s centralized Canadian milling along the canal: by 1860 they accounted for more than half of all Canadian export production²³², but in the next decade their hegemony was already diminishing, and by the turn of the century they had been consolidated as a single firm, with a rationalized but hencefore a less creative production space.

The first mills constructed were James McDougall's Canal Mills (1847) and Ira Gould's City Flour Mill (1848) at the canal Basin. Gould, for example, leased three lots at the Canal Basin on Mill street in 1847, and a year later his mill had twelve pairs of millstones and a five-storey grain elevator worth \$150,000.²³³ In 1852 A.W. Ogilvie, in partnership with his uncle James Gouldie, built the Glenora Mill at Saint-Gabriel Locks²³⁴, and in 1859 the saw mill of John Grant and John Smith Hall was converted into a flour mill, the Royal Mills. Table 6.8 shows the tremendous increase in the rents paid by the flour mills between 1861 and 1907.

The reasons for a restructuring of the flour industry are straightforward, based on a market of continental scope. As wheat was being produced further and further west, at great distances from Montreal, and exported to a world market, the city's share of the market began to taper off in the 1860s. The domestic market was

²³² In 1848 there were two small wind-powered flour mills in Griffintown. They had ceased operations by 1851. The capital-intensive character of the mills can be assessed from the fact that in 1871 each flour mill employee produced on average more than \$20,000 of output per year while the city average was little over \$1,500. In 1891 the city's four mills had capital to the value of more than \$2.3 million while only employing 231 employees. Canada, Census of Canada, 1871, vol. 3 and Canada, Census of Canada, 1891, vol. 3.

²³³ L. McNally, Water Power on the Lachine Canal, 1846-1900 (Ottawa: Parks Canada, 1982), p. 19.

²³⁴ A. Levine, "William Watson Ogilvie" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1990), vol. 12, pp. 800-801.

TABLE 6.8
RENT OF THE LACHINE CANAL FLOUR MILLS, 1861-1907

Flour Company	Rent (\$)			
	1861	1871	1890	1907
McDougall's Canal Mill (1)	1,700	4,800	-	-
Gould's City Mill (2)	3,200	3,200	2,500	6,500
Ogilvie's Glenora Mill	720	1,800	4,720	14,530
Grant, Hall (Royal Mill) (3)	3,200	3,460	4,000	6,000

(1) Ceased operations in 1885

(2) Bought by Ogilvie in 1891

(3) Acquired by Montreal Warehousing in 1872 and sold to Ogilvie in 1886.

Source: City of Montreal, Rôl d'évaluation, Saint-Ann ward, various years.

saturated by the 1870s, and Montreal milling was therefore vulnerable to foreign competition, as well as transcontinental freight rates, and most countries importing wheat preferred to mill it themselves. To cope with these pressures, Montreal millers expanded at locations outside Montreal. By 1888 Ogilvie had three mills, at Seaforth, Goderich and Winnipeg, besides the one in Montreal, and twenty elevators in Ontario, Manitoba and the North West Territories.²³⁵

In such competitive markets of global scope, one strategy was for firms to operate at the leading edge of technology. In 1872, the Cote Saint-Paul miller, William Parkyn patented a middling separator which separated flour into a number of different grades and made a much more consistent flour. This was used by Ogilvie as well. Two years later Ogilvie introduced the latest Hungarian steel rollers into his mill, a process which allowed for a third more work with half as much power and less maintenance.²³⁶ By the 1880s it was the dominant process in Canadian flour mills.²³⁷ The introduction of the Hungarian roller process, however, fixed manufacturers into producing a smaller range of lines. By the 1880s the flour millers were manufacturing a large amount of 'Superfine' flour, which could not be disposed of, and, by the standards of the earlier period, there were fewer intermediate grades

²³⁵ G.R. Stevens, Ogilvie in Canada, Pioneer Miller, 1801-1951 (Toronto: Ashton Potter, 1951), p. 10.

²³⁶ McNally, Water Power on the Lachine Canal, p. 63.

²³⁷ Canada Year Book, 1922-1923 (Ottawa: Acland, 1924), p. 445.

being made.²³⁸

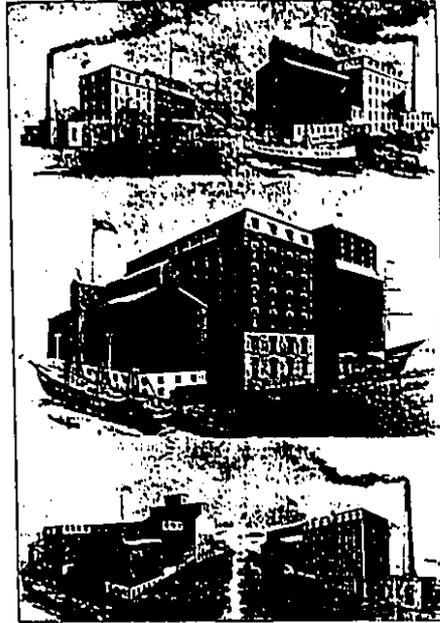
Because new technology and expanding markets required capital, they forced the pace of consolidation into large units. In 1865 Ogilvie acquired William Walker's small mill at the Saint-Gabriel Locks and over the years developed it into a massive flour mill. He was director of Montreal Warehousing when they bought out the Royal Mills in the crash of 1873. In 1886 he took over the Grant, Hall mill from Montreal Warehousing and extensively remodelled and equipped it with the latest machinery and equipment. In 1891 he purchased Ira Gould's City Mill for \$250,000. Since meanwhile (1835) McDougall sold his mill (the lots being parcelled out to a paint and varnish manufacturer and a rolling mill), there remained only three mills, all under the control of a single firm, acquired by the Hosmer syndicate in 1902 (see Figure 6.11).²³⁹ Three years later the company purchased the entire site between Mill street and the Lachine canal, and made extensive additions and installed new machinery.²⁴⁰ The four mills in 1861 totalled about \$9,000 in rent, in 1890 \$11,000, and in 1907 \$27,000, and productive space was radically transformed. The mills, in association with other large plants such as Canada Sugar and Montreal Steel Works were, in the words of a contemporary observer, "towering into the air on the canal bank" and surrounded by a

²³⁸ Canadian Journal of Commerce, June 6, 1884, p. 791. With the introduction of the Hungarian roller process, "the highest possible grades of flour are manufactured, although at the expense of the lower brands."

²³⁹ McNally, Water Power on the Lachine Canal, pp. 17-32, 57-66; Souvenir Number, np.; Stevens, Ogilvie in Canada, chap. 1; Willis, The Process of Hydraulic Industrialization, p. 351.

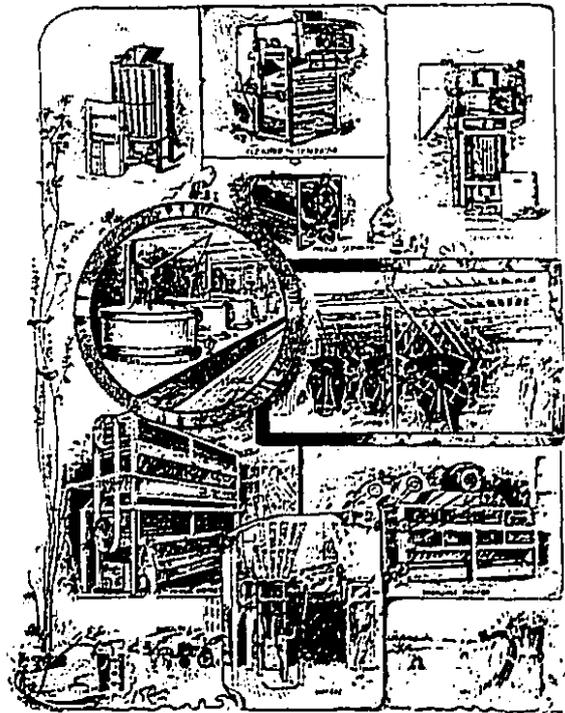
²⁴⁰ Canadian Engineer, April 21, 1905, p. 24.

FIGURE 6.11
THE OGILVIE FLOUR MILLS, 1889



OGILVIE & CO'S FLOUR MILLS

A. S. HARRIS, CHAS. & CO., ARCHT. & ENGRS., TORONTO. J. W. HARRIS, M. ENG'G., TORONTO. J. W. HARRIS, M. ENG'G., TORONTO.



MACHINERY OF OGILVIE & CO'S FLOUR MILLS, MONTREAL.

Source: The Dominion Illustrated, July, 6, 1889.

stream of loaded cars pouring along the wharf front ...; the floating elevators steaming about the harbour, ...; the bagging barges with their crowds of busy baggers, and the endless processions of heavily laden lorries with their loads of bagged grain.²⁴¹

The "towering" mills were a symbol of the growth and expansion that occurred through consolidation.

New productive spaces in the western suburbs

While the original core of the West End grew slowly, new industrial districts farther west climbed to prominence. The purpose of the rest of this section is to discuss in some detail one example of the creation of new industrial spaces in the West End: the suburban municipalities of Saint-Henri, Sainte-Cunégonde and Côte Saint-Paul which from the early 1850s developed as working-class industrial districts.²⁴² These suburbs, strung alongside the Lachine Canal to the west of the city limits, by the end of the nineteenth century constituted an important productive space of Montreal. Their histories, although separate were very similar, reflect an attempt by a spectrum of Montreal's bourgeoisie to create new productive relations within the context of new productive spaces. At the same time, they were an outgrowth of the dynamic growth of the Lachine Canal industrial district that was examined in detail in the previous chapter. Because of the different array of social relations and the timing of industrial development underlying the development of the

²⁴¹ Souvenir Number, p. 41.

²⁴² The aim is to build upon the work of the researchers associated with the Société historique de Saint-Henri by integrating the idea of productive spaces with the industrialization of these western suburbs.

western suburbs, they were not clones of the Lachine Canal district however. They differed from Saint-Ann's industry in the way that new production spaces were constructed and the industrial structure implanted in those new spaces.

By the mid 1870s, the industrial and spatial nucleus of the western suburbs of Saint-Henri, Sainte-Cunégonde and Côte Saint-Paul had been well enough established to constitute the beginnings of a significant industrial node within the Montreal spatial division of labour. Over the next forty years these suburbs would coalesce into one of the most important industrial agglomerations in the city. The basis of the industrial development of these municipalities was the breakdown of the past pre-industrial, artisanal culture of Saint-Henri and the creation of new productive spaces in Côte Saint-Paul and Sainte-Cunégonde; in all three cases the old productive system was replaced by a new set of productive relations. Instrumental in the development of these social relations was the restructuring of the districts' spatial relations. If we are to understand how this came about it is necessary to give a brief outline of their early beginnings before the 1870s.

Early development of Côte Saint-Paul

The 1850s and 1860s saw the development of a new built environment in the western suburbs which laid the basis for the full-scale development of capitalist industry. Local alliances parcelled out land for the construction of working-class homes, built the basic infrastructural framework, and established lax regulations for the construction and maintenance of the built environment. In other words, the

creation of a new set of productive relations by the 1870s was associated with the construction of a built environment which provided locational possibility for firms seeking new industrial spaces. The preceding years of development slowly but surely established the basis for a new milieu.

The beginnings of Côte Saint-Paul lie in the early 1850s when William Parkyn, the former owner of the St. Mary foundry in the city's east end, bought one hundred and ten acres of land alongside the Lachine Canal. Growth was not fast: in 1856, according to one Montreal newspaper, there was "not more than one house" in Côte Saint-Paul, while by 1859 the village could only boast of 400 to 500 members, most of whom were "more or less dependent upon the employment afforded by the factories".²⁴³ Miles from Montreal, Côte Saint-Paul was *terra incognita* for much of the city's business activities, isolated from workers, supplies and markets, and, as one writer noted, the suburb lay "at some distance from the great lines of city and suburban travel."²⁴⁴ From this inauspicious start, however, a small industrial village was established. Indeed, it was argued that their location alongside the canal was actually of great benefit to the firms that settled there:

one great advantage which these works possess is in their situation, which enables them to bring coals from Jersey City in the same boat they are embarked on at that place, without any transshipment or breaking of bulk. Grindstones can be brought from Ohio in the same way, and iron and steel have no very great distance to pass through the canal from the ship to the factory.²⁴⁵

²⁴³ McNally, Water Power on the Lachine Canal, pp. 49-50; Pilot, June 21, 1859.

²⁴⁴ Pilot, June 21, 1859.

²⁴⁵ Pilot, June 21, 1859.

Despite the advantage afforded by the canal, the industrial development of Côte Saint-Paul was hindered by the fact that it was miles from the city and isolated in terms of its 'factors of production'. Nevertheless, an industrial node did develop, but one restricted in size and importance. While removed from the main industrial currents of the city, the possibility of Côte Saint-Paul becoming a significant industrial district was further hindered by a small group of Montreal merchants and manufacturers who through control over the suburb's land and industrial development created a particular productive space that was inimical to large-scale growth.

Overseeing the development of Côte Saint-Paul, its industrial base and its capturing of the "Water Power supplied by the Lachine Canal" were the Montreal hardware merchants John Frothingham and William Workman who through "judicious expenditure" were "energetically pushing forward what may be looked on as a public spirited adventure as well as extension of private transactions."²⁴⁶ Established as a partnership in 1836, the hardware firm of Frothingham and Workman soon became the largest wholesale hardware company in Canada. They were typical of the Montreal bourgeoisie: both were promoters and shareholders in railroad and shipping companies and the City Bank of Montreal; they were involved in the Montreal Board of Trade and the Association for the Promotion of Canadian Industry; they had real estate interests throughout the city; and Workman was mayor of Montreal between 1868 and 1870. In the early 1850s they added manufacturing

²⁴⁶ Pilot, June 21, 1859.

at Côte Saint-Paul to their wholesaling business, where they were the agents for, and it appears the financial force behind, the edge tool factories located there.²⁴⁷ Certainly by 1872, as the company's merchandise catalogue of that year testifies to, they were the Canadian agents for products made at Côte Saint-Paul such as Dunn's nails, Gilmore's augers, and Moccock's edge tools (see Figure 6.12).²⁴⁸ Frothingham and Workman's activities at Côte Saint-Paul led to "a cluster of interdependent mills and shops" where the small manufacturers were "regulated by a parent hardware firm which acts as landlord, merchant creditor and manufacturer all at once."²⁴⁹ Their control over land and credit insured that a particular productive space was created in Côte Saint-Paul: a "landscape ... of a dependent industrial village under one omnipresent hardwaring thumb".²⁵⁰

From its establishment in 1853 Côte Saint-Paul grew slowly. In 1855 the frontage of four thousand feet along the canal was home to the factory sites that were to be the nucleus of the village's industrial development over the next fifty years (Table 6.9). There was a grist mill costing \$8,000 run by runs of stones and operated by William Parkyn; an axe factory which had cost \$6,000 and which utilized

²⁴⁷ G. Tulchinsky, "John Frothingham" in Dictionary of Canadian Biography, (Toronto: University of Toronto, 1976), vol. 9, pp. 288-289 and "William Workman", Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1972), vol. 10, pp. 717-718.

²⁴⁸ Frothingham and Workman, Price List 1872 (no publishing data).

²⁴⁹ Willis, The Process of Hydraulic Industrialization, p. 189. The importance of the metal-working firms can be gleaned from J. Lovell, Montreal Directory, 1871-1872 (Montreal: Lovell, 1871). In 1871 of the 170 residents of Côte Saint-Paul who had an occupation listed in the directory, sixty-one were metal related (such as shovel, auger, axe and scythe makers) while another twenty-three were labourers, many of whom probably did the dirty, physical labour required in the plants.

²⁵⁰ Willis, The Process of Hydraulic Industrialization, p. 189.

TABLE 6.9
INDUSTRY ON THE LACHINE CANAL AT COTE SAINT-PAUL,
1855-1874

Lachine canal lot number	1855	1866	1874
1	grist	flour	flour
2	axe	axe	axe
3	shovel	shovel	shovel
4	nail	scythe	scythe
5	-	nail	nail
6	-	-	nail
7	-	flour	flour
8	-	auger	auger
9	-	bell	bell
10	-	saw mill	saw mill
11	-	barrel	barrel

Source: The appendices of the "Report of the Commissioners of Public Works" in Journals of the Legislative Assembly of the Province of Canada, 1856 and Sessional Papers, 1867 and 1875.

two trip hammers, a fanner, five grind stones and four polishing machines; a shovel factory with a great deal of machinery and equipment; and S. and J. Dunn's spike and nail factory.²⁵¹ It was these industries - flour, edge tools and nails - that were to dominate the village's industry. By 1866 the number of factories at Côte Saint-Paul had grown to ten: nail, edge tools and flour production still dominating.²⁵² The two flour mills, while not large by the standards of the mills in Montreal, were, nonetheless, capable of grinding 460 barrels of flour per day and storing 105,000 bushels of grain and 6,000 barrels of flour.²⁵³ The Mount Royal flour mill was so up-to-date that one writer exclaimed that "to visit the process of manufacture in one of the old fashioned mills and the process as now carried on in these mills, the contrast is so striking." One "striking" feature of the mills was that "from the time the wheat is being taken out of the vessels until the flour is shipped, no process in the manufacture is even handled by manual labour, every thing being done by machinery" which included separators, scouring, brush, milling and bolting machines.²⁵⁴ The Dunns' nail factory, with a rolling mill, also employed machinery on an "extensive scale". In his axe factory, J. Higgins used a variety of 'modern' methods: furnaces using bitumen furnaces had been replaced by ten furnaces which

²⁵¹ "Report of the Commissioners of Public Works for the Year Ending 31st December", Appendix 31; Montreal in 1856, pp. 38-39.

²⁵² "General Report of the Commissioners of Public Works for the Year Ending 30th June, 1866", Appendix; W.J. Patterson, Report of the Trade and Commerce of the City of Montreal for 1868 (Montreal: Starke, 1869), p. 121.

²⁵³ General Report of the Commissioner of Public Works ... 1864, Appendix C, p. 33.

²⁵⁴ Borthwick, Montreal, p. 144.

"all vomited a white bright flame produced by anthracite coal"; and bellows had been replaced by "noiseless patent fans". Serving these factories was Paxton's barrel factory where a combination of machine and hand work produced casks "for packing the nails used at the adjoining works."²⁵⁵ By the 1874 there had been little change: Côte Saint-Paul had reached its zenith and there was to be little new growth over the next few decades.

Despite the advantages that manufacturers could receive through locating closer to the heart of the city, there did develop in Côte Saint-Paul a small industrial enclave strung along the banks of the Lachine Canal. This enclave was moulded by Frothingham and Workman who through control of credit and land development created a 'company town' where manufacturing was geared to providing augers, axes, nails and screws for their hardware company. Over the next forty years there would be little or no growth: firms changed hands, but there would be no development of new factories. One reason lay in the inadequate canal facilities. As the canal commissioner reported in 1864, there was only a depth of six feet in the canal at Côte Saint-Paul - it not being considered necessary to deepen it when the canal was expanded in the 1840s. He went on to say that, "it should be deepened to correspond with the enlarged canal, and suitable wharfage accomodation provided for these manufacturers."²⁵⁶ The manufacturers never realized the full potential of the water power at the canal. With more than one thousand horse power available, they never

²⁵⁵ Pilot, June 21, 1859.

²⁵⁶ "General report of the Commissioners of Public Works ... 1864", Appendix C.

used much more than half.²⁵⁷ Another reason lay in the limitations inherent in the dependency upon water power.²⁵⁸ The last reason has to do with the dynamics of change occurring in areas closer to the city core such as the stretch alongside the canal in Saint-Ann ward. Most of the advantages accruing to the Côte Saint-Paul manufacturers could also be obtained elsewhere, closer to the "great lines" of the city's industrial dynamics, where labour was more accessible, transport costs lower, and access to financial and commercial institutions greater. While Côte Saint-Paul remained under the tutelage of Frothingham and Workman it was to experience slow growth; a small nucleus developed but full exploitation of the area was restricted. By the turn of the twentieth century, Côte Saint-Paul, its traditional industries in decline, had become a working-class dormitory, while manufacturers seeking sites for their factories looked to other parts of the city.

Political regulation of and industrial development in Saint-Henri and Sainte-Cunégonde

Associated with the first wave of industrial development was the building up of the residential and infrastructural character of two villages closer to the "great lines of the city", Saint-Henri and Sainte-Cunégonde. This growth, as with Côte Saint-Paul, took place under the active guidance of a small group of Montreal and local business and political elites. The development of these sections of the western suburbs had roots deeper in the past while taking off more slowly than Côte Saint-

²⁵⁷ Patterson, Report of the Trade ... 1868, p. 121.

²⁵⁸ See Willis, The Process of Hydraulic Industrialization for a discussion of the these limitations.

Paul. Up to the late 1840s and the early 1850s Saint-Henri and Sainte-Cunégonde were distinct villages separated from Montreal by the open countryside of the Sulpician seminary lands. According to Lauzon and Ruellard, in 1850 "le village et la ville restent séparés l'un de l'autre par une vaste zone rurale."²⁵⁹ A small leather working village, Saint-Henri had a population of 466 in 1825 which had slowly increased to only 600 in 1852.²⁶⁰ Prior to the 1850s, it was a tanning and shoemaking village where production was conducted in artisanal workshops. With the transformation that was taking place in the regional shoemaking industry in the 1840s and 1850s, the 'putting out' system became the predominant organizational form.²⁶¹ Concurrent with the changes taking place to the shoemaking industry was the development of a new set of firms and industries that would, just as in Côte Saint-Paul, determine the future path that Saint-Henri and Sainte-Cunégonde would take. After 1850 there was a fundamental restructuring of the area as land was subdivided, infrastructure implanted, and the first wave of new manufacturing firms established.

In the late 1840s a large block of land in lower Saint-Henri (or Saint-Augustin as it was then known) was ceded to three associates who after "une série complexe de ventes, saisies, reventes" sold it to Arthur Webster. In 1855 Webster started selling

²⁵⁹ G. Lauzon and L. Ruellard, 1875/St-Henri (Montréal: Société historique de Saint-Henri, 1985), p. 4. For a discussion of Saint-Henri's growth and the social relations of the community before the 1830s see J. Burgess, "Work, family and community", vol. 2, chaps. 9-10.

²⁶⁰ Young and Dickinson, A Short History of Quebec, p. 167; G. Lauzon, Habitat ouvrier et révolution industrielle: le cas du Village St-Augustin (Montréal: Collection RCHTQ, 1989), p. 20; Willis, The Process of Hydraulic Industrialization, p. 97.

²⁶¹ Lauzon and Ruellard, 1875/St-Henri, p. 15.

off lots, eventually, in 1860, the lots being sold to another group of three associates. Over the next ten years, one hundred and sixty-one lots were sold; the lot developers leaving the building of houses to small builders who constructed small houses aimed for the working-class market. The area's population rose from just 300 in 1861 to more than 2,200 ten years later. In the mid 1850s, the first lots were being sold in the old village of Saint-Henri des Tanneries by the Turcot family. New streets were opened up and the population increased to nearly 2,500.²⁶² In Sainte-Cunégonde (or, as it was then known, Delisle village) land started to be sold off in the late 1840s by the fur merchant and politician Frédéric Auguste Quesnel. From the beginning, Alexandre Delisle, William Workman and Charles-Joseph Coursol, who between them had powerful financial, commercial, manufacturing and political connections in Montreal, were instrumental in helping Quesnel sell and subdivide land in Sainte-Cunégonde, lay out manufacturing sites, build roads, and put in sewers.²⁶³ As the residential and infrastructural components of the western district were laid down, and the first wave of industrial growth occurred, the area's population grew correspondingly and there was increasing clamour from the district's residents for political autonomy.

The incorporation of the separate villages into the town of Saint-Henri in February 1875 - Sainte-Cunégonde seceded from Saint-Henri in December 1876 -

²⁶² Lauzon, Habitat ouvrier pp. 15-19, 110-113; Lauzon and Ruellard, 1875/St-Henri, p. 11.

²⁶³ La Société historique de Saint-Henri, Portrait d'une ville, p. 4; C. Larivière, Petite Bourgogne (Montréal: Editions Québécoise, 1973), p. 16; E.Z. Massicotte, La cité de Sainte-Cunégonde de Montréal. notes et souvenirs (Montréal: J.S. Houle, 1893), p. 10; J. Monet, "Alexandre-Maurice Delisle" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1972), vol. 10, p. 220.

laid the basis for the political regulation of urban growth on the western periphery of Montreal. Despite the splitting-up of the original Saint-Henri into two separate towns, the towns' councillors "sont des propriétaires fonciers résidents, qui partagent une même vision de l'urbanisation industrielle."²⁶⁴ This entailed a massive program of tax exemptions for industry which was harnessed to a policy of minimal provision of basic infrastructures and control over the working-class habitat. In the first years after incorporation the two towns created very few essential infrastructures: fire and police services were established, street lighting installed, streetcar services obtained (after giving the City Passenger Railway Co. a tax exemption). Sainte-Cunégonde was more liberal with the funnelling of municipal funds to infrastructures - for example it set up its own aqueduct in 1879, whereas Saint-Henri did not even begin to consider water provision until 1880 - it, just like Saint-Henri, put most of its effort into industrial promotion.²⁶⁵ In the first years Saint-Henri provided tax exemptions to the Williams Sewing Machine Co (1878) and Merchant Manufacturing (1881), while Sainte-Cunégonde gave one to the Dresden Pottery Co (1879). These policies of industrial promotion and little infrastructural construction were to be the basis upon which the two towns developed until their annexation by Montreal in 1905

²⁶⁴ La Société historique de Saint-Henri, Portrait d'une ville, p. 6. See also Ouellet, "Les élites municipales et la municipalisation de Saint-Henri et Sainte-Cunégonde, 1875-1878" (Unpublished paper, Université du Québec à Montréal, 1982).

²⁶⁵ While nearly all Saint-Cunégonde streets had water pipes by 1890, the opposite was true for Saint-Henri whose "[w]ater system [was] put in by a private Co. without the services of an engineer". Plan of the Water Distribution of the Town of St. Henry (Montreal: November, 1890) and Plan of the Water Distributon of the City of St. Cunegonde (Montreal, November 1890).

because of their large debts and their incomplete set of essential services.²⁶⁶

By the early years of the 1870s Sainte-Cunégonde, and to a lesser extent Saint-Henri, had experienced a wave of capitalist industrialization that further integrated them into the wider Montreal economy and was to provide a significant industrial node for their future development. This first wave of industrialization was composed of a set of firms which produced a range of goods - nails, foundry products, engines, stoves, glassware, leather and crackers - which were made under conditions of untransformed labour and work practices. At the same time, some of the firms - Montreal Rolling Mill, St. Lawrence Glass, Davidson - were bankrolled by a combination of financial, mercantile and manufacturing capital. The leading players in the Montreal Rolling Mills for example, at its incorporation in 1868, were Thomas Morland, William Molson and Peter Redpath. As Kilbourn states,

these were men of substance whose advice was based on experience in many fields. They could talk on equal terms with Cabinet ministers. And they would bring back valuable intelligence and tangible support from their friends in the City of London on their regular visits to the world's financial capital.²⁶⁷

The districts' firms also served a wide array of different local and regional customers. The Canada Engine Works (run by E.E. Gilbert), for example, was a manufacturer of "steam engines and boilers, heavy forgings and castings, iron ships and bridge work, machinery for saw mills, grist mills, sugar factories, tanneries, etc, etc".²⁶⁸ In

²⁶⁶ Collin, "La Cité sur mesure"; Ouellet, "Les élites municipales" and La Société historique de Saint-Henri, Portrait d'une Ville, pp. 5-14.

²⁶⁷ Kilbourn, The Elements Combined, pp. 20-21.

²⁶⁸ John Lovell, Montreal Directory (Montreal: Lovell, 1876), p. 443.

other words, while the firms remained committed to traditional work practices and local markets, they were linked into the wider sphere of Montreal and foreign business modalities. At the same time, these establishments would be powerful magnets to attract other firms to the suburban districts of Saint-Henri and Sainte-Cunégonde. Magnets not so much in the direct physical linkages that were created, more by the changes made to the use of space and the comparative advantages of the area.

Take the St. Lawrence Glass Works for instance. While its existence in Sainte-Cunégonde was short - established in 1867 it closed down in the early 1870s²⁶⁹ - it illustrates the type of development that was taking place in the area in the years following the middle of the century. One of the major threads of Montreal's industrial development in this period was the replacing of imports with domestic-made products. The St. Lawrence Glass Works was no exception:

Hitherto the glassware of domestic use, ..., has been imported from Europe and the United States. But to obviate this a large establishment named the St. Lawrence Glass Works has been established and brought into successful operation.²⁷⁰

Employing untransformed labour that was characteristic of capitalist industrialization in the second half of the nineteenth century, the manufacture of the glass products was organized into "shops" - teams of skilled glassblowers, finishers and their helpers

²⁶⁹ Commercial Sketch, p. 5. Lauzon states that it shut down in 1871 while I was able to find it, in the city directories, through to 1873. As the directories were often slow in adding new and taking out old information, Lauzon's is probably the correct date.

²⁷⁰ H.B. Small, The Products and Manufactures of the New Dominion (Ottawa: G.E. Desbarats, 1868), p. 143.

who worked as a unit and were paid by the piece. Although the members of the shops worked as a group they were under the supervision of an "experienced superintendent". In 1871 the 117 employees of the company worked in "four large brick buildings, forming a quadrangle" with a total fixed capital of \$50,000. In these buildings imported white sand from the Berkshires in Massachusetts was dried, mixed with other compounds in pots in a furnace to form a "partially fluid consistency", and then manipulated into lamp chimneys, phials and goblets.²⁷¹ St. Lawrence Glass is also an example of the early development of the corporation into the western districts. Its board of directors included some of the major players in Montreal's industrial and political life and the development of the west end - William Workman, A.M. Delisle and Peter Redpath - who pumped in \$20,000 before the plant was closed down.²⁷²

Although prior to the incorporation of the villages most industrial development occurred in Sainte-Cunégonde, there was a breakdown of Saint-Henri's artisanal mode of production by the 1870s which was to pave the way for full capitalist industrialization later on the century. As was mentioned above, Saint-Henri had traditionally been an important leather-making village. By the 1870s, however, this had changed even though the leather industry continued to be an important component of Saint-Henri's growth.²⁷³ By the early 1880s there were ten boot and

²⁷¹ Lauzon, Habitat ouvrier, p. 40; Small, The Products and Manufactures, pp. 143-146.

²⁷² Commercial Sketch, p. 5; Willis, The Process of Hydraulic Industrialization, p. 398.

²⁷³ C. Ouellet, "Les industries du cuir à St-Henri, 1871-1891" (Unpublished paper, Université du Québec à Montréal, 1981).

shoe enterprises, two tanneries and one factory for making saddlery. The three latter firms were medium-size firms employing steam power to drive machinery and were linked to Montreal through the offices they kept there.²⁷⁴ On the other hand, the boot and shoe firms were small in scale, the ten firms in 1886 employing only seventy-four workers. This does not signify the persistence of artisanal production, however, but the integration of the trade into the wider Montreal economy through the existence of sub-contracting. By the 1870s the Saint-Henri firms were firmly linked to the larger firms of Montreal who passed out work to the small shops in the suburb.²⁷⁵

New rounds of industrialization in the western suburbs

By the 1870s then, the industrial base of the three western suburban districts had been firmly established and was rooted in the construction of a residential, infrastructural and political system that was amenable to the installation of firms that utilized a particular range of productive strategies. Over the next forty years these traits were to be solidified and extended. An array of productive practices were implanted that were built upon the earlier wave of industrial growth, were specific to the western part of the city alongside the canal, and were deeply imbricated with each other. This industrial growth was orchestrated by a municipal political elite

²⁷⁴ In 1883 the Moseley and Ecroyd tanneries had machines worth \$10,250 and \$4,500 respectively, while Ecroyd and St-Henri Carriage Leather maintained offices in Old Montreal. See Ouellet, *Les industries du cuir*", pp. 10-12, 21.

²⁷⁵ Ouellet, "Les industries du cuir", pp. 18-22.

which not only worked to attract industry, but also benefited from the particular way that productive space was shaped. Once set in motion, these suburbs in the last three decades of the nineteenth and the beginning of the twentieth century became the site of a particular array of industries and a large working-class population. It is the contention of the work associated with the Société historique de Saint-Henri that the firms that moved to Saint-Henri (and by implication to Sainte-Cunégonde) had little in common with each other.²⁷⁶ For example, Gilles Lauzon states that "en 1913, la structure industrielle de Saint-Henri apparaît comme un 'patchwork', sans logique."²⁷⁷ An aim of the remainder of this section is to show that there was, in fact, a logic to the types of firms moving into the western suburbs. This lies not so much in direct linkages between firms of the same industry as Lauzon would argue, but rather in the production formats of the firms and their ability to carve out or take advantage of new productive spaces.

Industrial expansion from the 1870s to the end of World War I took place in two rounds of investment. After 1876, this area would experience a wave of industrial growth that would last for just over a decade, and that built upon and extended the existing enterprises that had been established by the early 1870s. The extent of the district's growth can be assessed from Table 6.10 which shows that from a mere twenty firms in 1871 employing 597 workers and only half a million dollars in capital,

²⁷⁶ See C. Ouellet, "Rapport de recherche sur les implantations industrielles et commerciales dans la ville de Saint-Henri, 1876-1905" (Unpublished paper, l'Université du Québec à Montréal, 1980), p. 16; Lauzon, "Le développement industriel", p. 29 and La Société historique de Saint-Henri, Portrait d'une ville, p. 14.

²⁷⁷ Lauzon, "Le développement industriel", p. 29.

TABLE 6.10
INDUSTRIAL GROWTH IN SAINT-HENRI AND SAINTE-
CUNEGONDE, 1871-1901

Year	No. of Firms	Value of Produce (\$)	No. of Workers	Capital Invested (\$)
1871	20	453,480	597	n.a.
1881	94	1,119,415	1,233	1,870,355
1891	128	4,476,580	3,035	4,386,998
1901	34	7,279,371	5,581	7,079,772

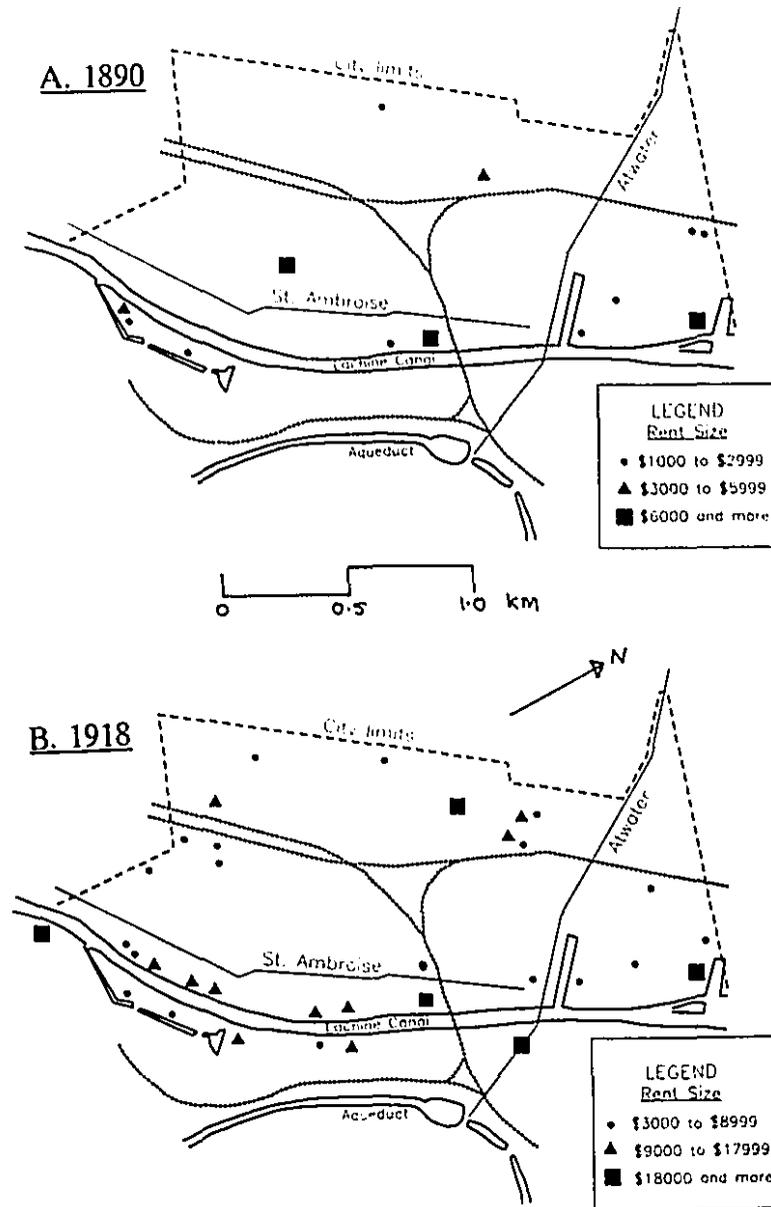
Source: Canada, Census of Canada, 1871-1901, vol. 3.

Saint-Henri and Sainte-Cunégonde by 1891 had one hundred and twenty-eight firms providing jobs for 3,035 workers and producing goods to the value of almost \$4.5 million.²⁷⁸ In this wave of growth, despite the depression of late 1870s, a number of large firms were established in the western district. This was especially true for the two most eastern suburbs where an influx of firms added greatly to the previous round of industrial investment. Firms such as the Williams Manufacturing Company (1879), makers of sewing machines, Merchants Manufacturing (1881), the huge cotton manufacturer and L'Union des Abattoirs de Montréal (1882) settled in Saint-Henri in this period. Sainte-Cunégonde was the recipient of firms such the Singer Manufacturing Company (1883), McCaskill's varnish works (1883), the door and sash factory of William Rutherford (1886), and the brass foundry of Robert Mitchell (1889). The establishment of large firms in Côte Saint-Paul was limited, with only one large firm moving there, Montreal Blanket in the late 1880s. By 1890 then, as the boom was receding in strength (between 1889 and 1894 no large firms settled in the western suburbs), there had been a gradual implantation of industrial investment over the previous two decades, with Saint-Henri, in particular, experiencing a great deal of growth (Figure 6.13).

After a period of quiescence during the depression that rocked Canada in the 1890s, another broad front of industrial growth took place that lasted from the mid-1890s through to World War I. The last census figures for the western districts reveal

²⁷⁸ It should be noted that the manufacturing establishments of Côte Saint-Paul are not included in this table as the census did not separate it out from the county figures.

FIGURE 6.13
LOCATION OF THE LARGEST FIRMS IN THE WESTERN SUBURBS,
1890 AND 1918



Source: Saint-Henri, *Rôle d'évaluation*, 1891; Sainte-Cunégonde, *Rôle d'évaluation*, 1890; Côte Saint-Paul, *Rôle d'évaluation*, 1895; City of Montreal, *Rôle d'évaluation*, 1918, Saint-Henri, Saint-Joseph and Saint-Gabriel wards.

that at the turn of the century, more than five and a half thousand people worked in thirty-four firms with five or more employees and produced goods to the value of \$7 million.²⁷⁹ By 1905, however, when Saint-Henri and Saint-Cunégonde were annexed to Montreal, the latter town had reached the peak of its industrial growth. It was in this period that there was a resurgence in the industrial strength of the Côte Saint-Paul area with the arrival of firms such as the Mount Royal Spinning Co. (1907) and the Sherwin-Williams paint plant (1903). In the period up to the end of World War I the western district consolidated its industrial strength in two ways. The first was through the expansion of existing firms such as Davidson's tinware factory and the Montreal Rolling Mills. The second was by attracting firms from a variety of industrial sectors: new sectors were established (biscuit and confectionery, chemical, and food) and traditional ones continued to grow (metal and textile). By the beginning of World War I, the district had, for the most part, been built up (Figure 6.13).

Despite the tremendous growth of industry from the 1870s to the end of World War I the districts' industrial structure exhibited a great deal of stability (Table 6.11).²⁸⁰ Throughout the period the metal, textile and food processing

²⁷⁹ Figures taken from Canada, Census of Canada, 1901, (Ottawa: S.E. Dawson, 1905), vol. 3, Table 20, pp. 326-330. The fall in the number of firms between 1891 and 1901 was on account of the census redefinition of what constitutes an industrial firm. See Chapter 1.4. After 1901 it is no longer possible to find separate figures for the the suburbs as they were included in the Montreal compilations.

²⁸⁰ The rôle d'évaluation for the three suburbs were set up differently from those of Montreal. While the identification of manufacturing rents for Sainte-Cunégonde was relatively easy - firms were identified by a *loyer magasin* and then cross-linked to Lovells - there were problems with the other two suburbs. The major problem with Saint-Henri was that both firms and residences were entered under the same category, *loyer*. It proved to be a much more difficult job to disentangle manufacturing firms from all other uses of space, and it is possible that a number of firms, especially small proprietarial ones, were not included. In

TABLE 6.11
THE INDUSTRIAL STRUCTURE OF THE WESTERN SUBURBS,
1890 AND 1918

Sector	No. of firms	1890 RENT		No. of firms	1918 RENT	
		Aggregate (\$)	%		Aggregate (\$)	%
Metal	18	26,537	33.8	33	154,410	31.5
Textile	4	22,691	28.9	10	133,250	27.2
Food	10	13,235	16.9	23	57,020	11.6
Wood	11	4,288	5.5	10	19,320	3.9
Leather	21	3,858	4.9	8	13,130	2.7
Clothing	13	2,033	2.6	16	13,320	2.7
Chemical	2	474	.6	3	31,100	6.3
Electrical	1	444	.6	2	9,500	1.9
Tobacco	-	-	-	1	39,300	8.0
Other	6	4,911	6.2	13	19,780	4.0
Total	89	78,466	100.0	117	490,130	100.0

Note: The data includes only that part of Côte Saint-Paul area that lay along the Lachine canal.

Source: City of Montreal, Rôle d'évaluation, 1918, Saint-Henri, Saint-Joseph and Saint-Gabriel wards; Saint-Henri, Rôle d'évaluation, 1890; Sainte-Cunégonde, Rôle d'évaluation, 1890; Côte Saint-Paul, Rôle d'évaluation, 1895.

sectors dominated in terms of number of firms and the value of rent, even though their share of the aggregate rent had declined by 1918. Although Merchant Manufacturing and Montreal Rolling Mills continued to account for a large share of their respective sector's rent in this period, several other important firms moved to the western suburbs. While these older sectors maintained their relative strength, other traditional sectors such as leather and wood had diminished in importance, while new sectors - chemicals and tobacco - appeared. Another dimension of the district's industry was the uneven growth by suburb. While Sainte-Cunégonde started off as the industrial core of western fringe, by 1890 its share of rent was only thirty-three percent and this fell dramatically over the next twenty-eight years to fourteen percent. In contrast the percentages of Saint-Henri and Côte Saint-Paul rose from forty-nine to fifty-nine, and from seventeen to twenty-seven respectively.

The movement of large firms to the western suburbs: three illustrations

In the western suburbs the arrival of large number of firms at the turn of the century was built upon the restructured space of the preceding period, where a number of firms from a narrow range of industries, in association with the active encouragement of the local petite bourgeoisie, moulded the form that the district would (and could) take. This involved the provision of subsidies to firms, the existence of a large and varied work force, and the availability of large sites close to

the case of Côte Saint-Paul the rent was not given. A surrogate for rent was obtained by taking ten per cent of the total value of the site (ie., ground and building). This figure of ten per cent is approximately what the rent was in comparison to total value for Montreal in 1890.

water and rail tracks. While the large firm had been an important strand of the western suburbs' growth since the 1860s, the number by the end of the century had grown considerably. To better understand the reasons for the removal of firms to this part of the urban periphery, however, we need to delve deeper into the historical antecedents of the western suburbs through an examination of the Montreal Rolling Mills. This will be followed by a discussion of two firms that settled in the first decades of the twentieth century, Sherwin Williams and Imperial Tobacco.

To illustrate the importance of the early history of the district for its future development a discussion of a firm will be presented - the Montreal Rolling Mills - that reflects, shaped and parallels one strand of the development of the western suburbs and the transition of industrial capitalism from the mid-nineteenth century to World War I. In the 1850s and early 1860s the Montreal hardware merchants of Thomas Morland and Charles Watson were facing a number of problems. As well as having price and quality difficulties with imported hardware lines, the building of rolling mills by other Montreal manufacturers threatened their control over the manufacture of saws, axes and other edge tools. In order to counteract these threats, Morland and Watson sank \$150,000 into the construction of a rolling mill on the banks of the Lachine Canal just inside the limits of Sainte-Cunégonde in either 1864 or 1865. Selecting some of the most powerful merchants, financiers and industrialists of the day as directors, Morland and Watson turned the firm into a joint-stock company with \$200,000 of capital in 1868. With the new influx of capital, the participation of a section of Montreal's bourgeoisie, large credits from the Bank of

Montreal, and a sympathetic federal government willing to provide tariff relief, the mill became the largest in the district and one of the leading factories of the Montreal area.²⁸¹ With the initial capital outlay, the number of employees working in the firm quickly rose. By the late 1860s it employed 350 workers in the manufacture of iron bars and sheets, and nails. The mill where three large steam engines operated an array of machines for making wrought, shingle and horse shoe nails was divided up into a rolling mill, and lead, nail, and horse shoe nail departments. On the canal banks were the coal sheds where "every modern appliance is here erected for expeditious discharge of the vessels which bring the black diamond direct from the mines."²⁸² According to the census of 1871 there were 262 workers in the mills and its fixed capital stood at \$200,000.²⁸³ In this period the company also controlled factories which manufactured saws and axes for the domestic lumber trade.²⁸⁴ By the 1870s then the rolling mills was a large factory producing a variety of goods and controlled by some of the leading industrialists of the day. As one writer observed, "[s]tanding in the centre of the yard, and looking around, one begins to appreciate the magnitude of the business and the enormous

²⁸¹ Kilbourn, The Elements Combined, pp. 19-23.

²⁸² T.W. Raphael, Annual Review of the Trade and Commerce of Montreal for 1866, p. 9; Commercial Sketch (Montreal: Herald, 1867), pp. 9-11. The quote is from p. 11.

²⁸³ I do not know why there should be such a sharp discrepancy between the number of employees in 1866 and the number in 1871. It is of course possible that in the former year that the actual number was added to while in the latter it was lower. It is also possible that the figures reflect seasonal changes to the workforce or changes due to business cycles.

²⁸⁴ Raphael, Annual Review, p. 9.

amount of capital requisite to successfully carry it on".²⁸⁵ Covering an area of two and a half acres and situated in the small village of Sainte-Cunégonde, Montreal Rolling Mills was an important suburban firm (See Figure 6.14). The introduction of new iron technologies by Montreal capitalists in the form of a large, multi-unit rolling mill and finishing works on the suburban fringe of the city represented an important adaptation to the requirements of industrial capitalism in the second half of the nineteenth century.²⁸⁶

From these early beginnings the mill continued to grow. An iron pipe mill (Canada's first) was built in 1881 and six years later, because of increasing demand for wrought iron pipe, a new pipe mill was built which was supplied with the latest improved gas producers and furnaces, which doubled capacity, giving an output of thirty tons a day.²⁸⁷ By 1890 the mill had a workforce of 625 (600 of them being male), had sunk \$620,000 in fixed capital, and had an annual rent of \$7,194, which made it the tenth largest plant in the city.²⁸⁸ With the constricted markets and falling prices of the 1890s depression firms were forced to choose from a range of strategies to ensure that these problems did not lead to smaller markets or

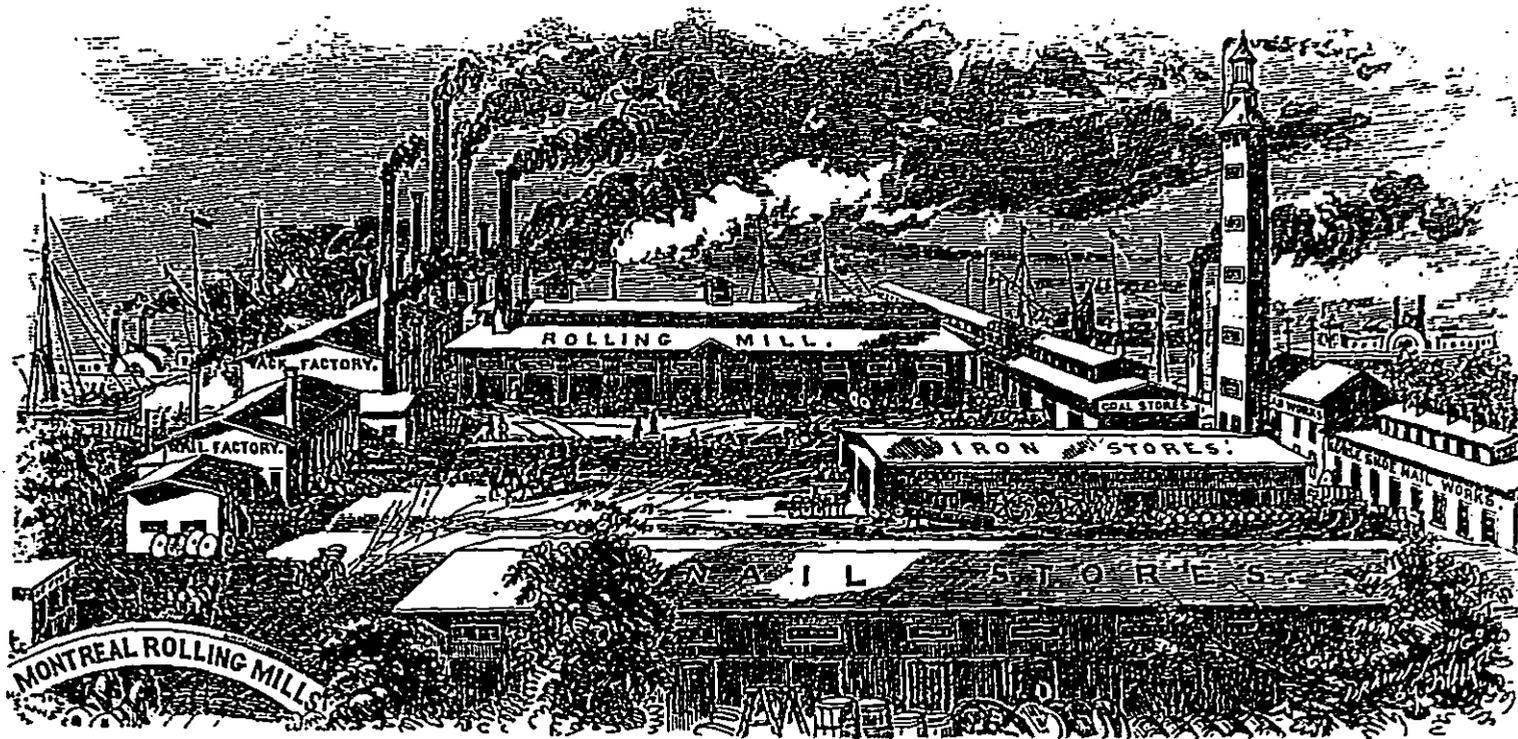
²⁸⁵ Commercial Sketch, p. 11.

²⁸⁶ For a discussion of the changes to Canada's steel mills in this period see Heron, Working in Steel, pp. 34-42.

²⁸⁷ Canadian Journal of Commerce, October 14, 1887, p. 712. Kilbourn, The Elements Combined, p. 23.

²⁸⁸ J. Lovell, Lovell's Historic Report of the Census of Montreal, 1891 (Montreal: Lovell, nd), p. 82 provides the employment figures while Canada, Census of Canada, 1891, vol. 3 provided the fixed capital data.

FIGURE 6.14
THE MONTREAL ROLLING MILLS, 1868



443

Source: Commercial Sketch, p. 8

bankruptcy. The response of the company was to restructure its products and to introduce new technology. To complement wrought nail and nail plate production wire mill and wire nail machines were installed and the company slowly introduced steel manufacture alongside that of iron. The rationalization of the labour process was difficult as the company's skilled workers fought to maintain their control over the pace of work and machinery. Wage reductions were also not a particularly viable strategy as a substantial number of the workers refused to work at cut rates for more than a short amount of time.²⁸⁹ Some events of the 1880s illustrate the problems of overproduction and worker resistance. In 1885 the Montreal Rolling Mills along with "other firms engaged in the same industry have felt" the problem of over production "and have felt compelled to discharge hundreds of first-class hands".²⁹⁰ Two years later more than 1,000 workers of three Montreal rolling mills, including Montreal Rolling Mills, went on strike over a ten per cent reduction in wages.²⁹¹

Another spasm of growth occurred with the long period of expansion beginning in the late 1890s. By the early 1900s the mill was worth one and half million dollars in stock and half a million in bonds, and had annual sales of four and half million. In 1905 the company's new rolling mill (the old one had been destroyed by fire in 1900) had three trains of rolls with a capacity of 25,000 tons of rolled products and 12,000 tons of skelp, while its finishing departments produced large

²⁸⁹ Kilbourn, The Elements Combined, pp. 23-25.

²⁹⁰ Montreal Daily Star, January 15, 1885, p. 4. Montreal Rolling Mill "dispensed with the services" of more than 150 nailmakers.

²⁹¹ Hamelin et al., Répertoire des Grèves, p. 91.

amounts of horsehoes, horse nails, wire, wire nails, tacks, staples and an assortment of other metal products.²⁹² The problems that many other firms faced, namely too much competition and overlapping product lines, forced Montreal Rolling Mills to find new ways of coping. In 1902 the company bought out two of its leading competitors, the Pillow and Hersey rolling mill (on Mill street in Saint-Ann district) and the Hodgson Iron and Tube Company (located on the canal in Saint-Henri). Despite the advantages of reduced competition, large capital reserves, cheap raw materials (from its own Nove Scotia steel plant), and wide sales, the mill in the first decade of the new century was reeling from a combination of the after-effects of the 1890s depression and the growing competition from Ontario rolling mills and the huge integrated American firms. Its response to these threats was to amalgamate with firms from Ontario through vertical and horizontal integration.²⁹³ Rather than following the British model where hundreds of small-scale firms dotted the industrial landscape, Montreal Rolling Mills imitated American companies such as Carnegie and selected as a model of development increasing scale, the application and development of new processes and techniques, and the advantages associated with those.²⁹⁴ At the time of its merger with other Canadian iron and steel firms to form the Steel Company of Canada in 1910 the Montreal Rolling Mills covered more than

²⁹² "The iron and steel works of Canada", Canadian Manufacturer, January 6, 1905, p. 21.

²⁹³ Kilbourn, The Elements Combined, pp. 19-32.

²⁹⁴ For a discussion of how the British and American steel industries differed see B. Elbaum and F. Wilkinson, "Industrial relations and uneven development: a comparative study of the American and British steel industries", Cambridge Journal of Economics, 1979, 3, pp. 275-303.

ten acres, had fourteen departments, three warehouses and two engine rooms housed in buildings valued at almost half a million dollars and operated machinery worth \$80,000.²⁹⁵

This brief overview of the Montreal Rolling Mills' development from its establishment in the early 1860s to its merger in 1910 highlights the importance of the early development of the large-scale, highly capitalized, corporate owned and organized firm for the suburbs. The installation and subsequent expansion of the mills were, according to Willis, of tremendous importance to the district.

By virtue of the scale and diversity of production Montreal Rolling Mills elevated the south-west Montreal iron industry into the age of factory capitalism leaving behind the older merchant/petty producer system in the process.²⁹⁶

Along with its role as a harbinger of a particular form of industrial capitalism to an artisanal corner of the Montreal region, it created a milieu for firms to see the western suburbs as a viable location. A new set of productive relations could be installed without the problems that existing districts had. These firms were able to create a new productive space in which a rationalized and high-volume productive system could be installed. This trend was not strongly evident in the first wave of growth before the early 1870s as the banks of the Lachine canal closer to the city were still the major recipient of the large-scale form of industrial firms. This particular dimension of the western suburbs started to become important at the end

²⁹⁵ City of Montreal, Rôle d'évaluation, Saint-Cunégonde ward, 1908.

²⁹⁶ Willis, The Process of Hydraulic Industrialization, p. 370.

of the 1870s with the establishment in Saint-Henri in 1881 of the Merchant Manufacturing Company cotton mill, a high-volume, highly mechanized factory, and L'Union Abattoir (1880) and the sewing machine companies of Williams (1879) and Singer (1883). For companies like the Merchant Manufacturing cotton mill the West-End suburbs provided an alluring combination of advantages which most other manufacturing districts of the city did not possess: excellent transportation facilities, accessibility to a large and varied labour force, proximity to an existing large industrial complex (Saint-Ann) and large sites where large buildings could be constructed and eventually expanded. While the western district received few large mass-production manufacturers during the boom between 1876 and 1889, a large number moved there in the boom following the depression of the 1890s.

The building of the American-owned Sherwin-Williams paint and varnish plant in 1903 provides an interesting example of the importance of new industrial space in the western districts for an already established industry which was being restructured and consolidated. Throughout the nineteenth century the chemical industry developed slowly, remaining a small-scale, proprietary industry, although changes in labour and technology at the end of the century would propel it along new lines of development.²⁹⁷ One of the most important branches of the chemical industry was paint manufacture where the technology of production was well known, and this combined with the substantial profits to be made as suppliers of necessary intermediaries for large and numerous consumer-goods producers led to Montreal's

²⁹⁷ Chandler, The Visible Hand; Dyer and Sicila, "From commodity to speciality chemicals".

paint trade being overcrowded and "more paints were ground and made than the capacity of the country could legitimately absorb."²⁹⁸ The response, as in so many industries, was consolidation. In 1894 one of the largest paint manufacturers in the city, William Johnson, joined up with two firms from Toronto and Winnipeg to form the Canada Paint Company, thus giving them a Canada-wide network of paint, varnish and linseed oil factories as well as oxide and graphite mines. Canada Paint was acquired by the American firm Sherwin-Williams in 1911 so that "large economies will be effected" such as the more economical production of goods through plant specialization, the reduction of handling costs, and the production and control over their raw materials.²⁹⁹ In 1892 Sherwin-Williams had established a Montreal agency under the control of W.H. Cottingham. In 1903 the company built a factory on the Lachine Canal at the border of Côte Saint-Paul on a four acre site which, in the words of one observer, was not only "the most modern ... of its kind in the world", but also the most "complete": it comprised paint, varnish, linseed oil, can and box departments "all connected and operated by one central power plant, insuring economy and efficiency in operating."³⁰⁰ With years of experience of the Montreal economic environment through their agent, Cottingham, there can be little

²⁹⁸ G.D. Taylor and P.A. Sudnik, DuPont and the International Chemical Industry (Boston: Twayne, 1984), chap. I; Souvenir Number, p. 53. From its development at mid-century the Montreal paint and varnish industry had been concentrated in Saint-Ann. In 1890, for example, eight of the ten paint firms in the city were located in Saint-Ann and they accounted for more than ninety-five per cent of the industry's rent.

²⁹⁹ Houston, Annual Financial Review, November 1911, p. 111.

³⁰⁰ Houston, Annual Financial Review, November 1911, p. 110; Communaute Urbaine de Montréal, Architecture Industrielle (Montréal: Communaute Urbaine de Montréal, 1982), pp. 178-181.

doubt that Sherwin-Williams chose the Lachine canal bank in full knowledge of the locational possibilities of the city. The company knew that the western suburbs were a favourable site for firms employing a high-volume, mass market production format.

The next illustration is the leading cigarette manufacturing firm of the period, Imperial Tobacco Company, which moved to a new factory in Saint-Henri in 1907. It provides an example of a firm from a relatively new industry that took advantage of the particular set of advantages available in the western district. Imperial was one of the major reasons why Montreal's cigarette production increased dramatically after the late 1880s. From little production before 1885, Montreal's production of cigarettes increased twelvefold from just over a hundred million in 1900 to more than one and half billion in 1918, while the amount of invested capital in cigar and cigarette firms rose from little over one million in 1891 to more than nineteen million by 1918.³⁰¹ Imperial was distinguished by a select set of productive and spatial strategies that, with few exceptions, set it apart from other tobacco firms.

One strategy that Imperial pursued was consolidation and the acquisition of other firms. Imperial Tobacco of Canada was founded in 1908, as a result of a deal set up by the two world leaders of cigarette making, American Tobacco (which established a factory in Montreal in 1895) and Wills and Wills. While most other

³⁰¹ Canadian Cigar and Tobacco Journal, October 1900, p. 424 and June 1918, p. 19; Canada, Census of Canada, vol. 3; Quebec, Statistical Yearbook of Quebec, 1920 (Quebec: L-S. Proulx, 1920), p. 357. Even though the capital figures refer to both cigars and cigarettes most of the increase took place in cigarette production. Some idea of the growth of cigarette manufacture can be gained from the statements of contemporary observers. In 1907 one writer opined that "cult of the cigarette is advancing at an accelerated ... pace, and there seem to be no limit to the expansion of this branch of our trade." In 1911 a commentator crowed, "we have to search for further superlatives" when looking for new ways to describe the expansion of cigarette production". Canadian Cigar and Tobacco Journal, September, 1907, p. 11; June 1911, p. 11.

tobacco firms remained small in scale and proprietary in character, the Montreal plant of American Tobacco, and after 1907 its successor Imperial, acquired a number of tobacco firms in Montreal and the surrounding area. The purchase in 1895 of D. Ritchie (Montreal's first cigarette manufacturer, established in 1885) and American Cigarette (1888) was motivated by these companies' control of the Canadian cigarette market; the buyout enabled American Tobacco to be the only large-scale manufacturer of cigarettes in Canada.³⁰² In the following years, American Tobacco acquired snuff, tobacco and cigar firms, giving the company an important entry into all branches of the tobacco industry, except in cigars where, as happened to James Duke in the United States, the fragmented and regional character of the trade militated against the growth of one large company controlling the entire market.

Associated with the building of a Canadian tobacco empire was the implementation of a strategy based on large-capital investments in plant and machinery. In 1908 when Imperial absorbed American Tobacco it was capitalized at \$11 million, of which, "a large proportion will be necessary to acquire the American, Empire and other factories". Four years later it increased its capital to \$40 million to take care of increasing business, to purchase more machinery and for continued expansion of the Saint-Henri plant.³⁰³ From the very beginning Imperial was a highly mechanized firm. The introduction of Bonsack machines enabled it to

³⁰² Canadian Cigar and Tobacco Journal, November 1902, p. 647. It should be noted that this journal and the city newspapers give little information about Imperial (or American Tobacco). Searches through the newspapers at important dates - such as the building of the new Saint-Henri plant - unearthed no information.

³⁰³ Canadian Cigar and Tobacco Journal, July 1908, p. 33; December 1912, p. 29.

pursue a policy of high-volume production using continuous-processing methods with a largely unskilled work force.³⁰⁴ The result was that the machine, which had taken over from hand labour by the late 1880s, "revolutionized the cigarette industry and when run at top speed it turns out over a hundred thousand cigarettes daily, whereas but a thousand or so were previously made by hand"³⁰⁵; skilled cigarette rollers were replaced by 'operatives', mainly female, who were simple machine-tenders; "the varying shapes of ... cigarettes, once characteristic of each country, are gradually yielding to a more uniform product"; machine replacement was easier for larger firms; and entry into the cigarette branch became more difficult as the amount of capital needed to start up was exorbitant for small capital.³⁰⁶ Related to this was Imperial's strategy of making a small number of standard lines of Virginia cigarettes, the primary differentiating factor was competition through brand names which they backed up with an extensive advertising campaign and manipulation of a wide distribution network.³⁰⁷

The spatial strategy of Imperial was directly related to these productive

³⁰⁴ The Bonsack machine, introduced in the 1880s, which, after an improved model had been introduced in 1890, could make 120,00 cigarettes a day. By 1900, at least, cigarette machines were "used in all [Montreal] factories." Canadian Cigar and Tobacco Journal, June 1900, p. 235.

³⁰⁵ Canadian Cigar and Tobacco Journal, June 1900, p. 235.

³⁰⁶ A summary in the Canadian Cigar and Tobacco Journal of a United States Bulletin on the world tobacco industry discusses the results of machines taking over in cigarette manufacture. See May 1915, p. 9. One strategy that small capital was to implement however was the creation of smaller firms employing hand labour in the manufacture of luxury cigarettes from high-quality leaf. In Montreal after 1900 several firms were established to service this niche.

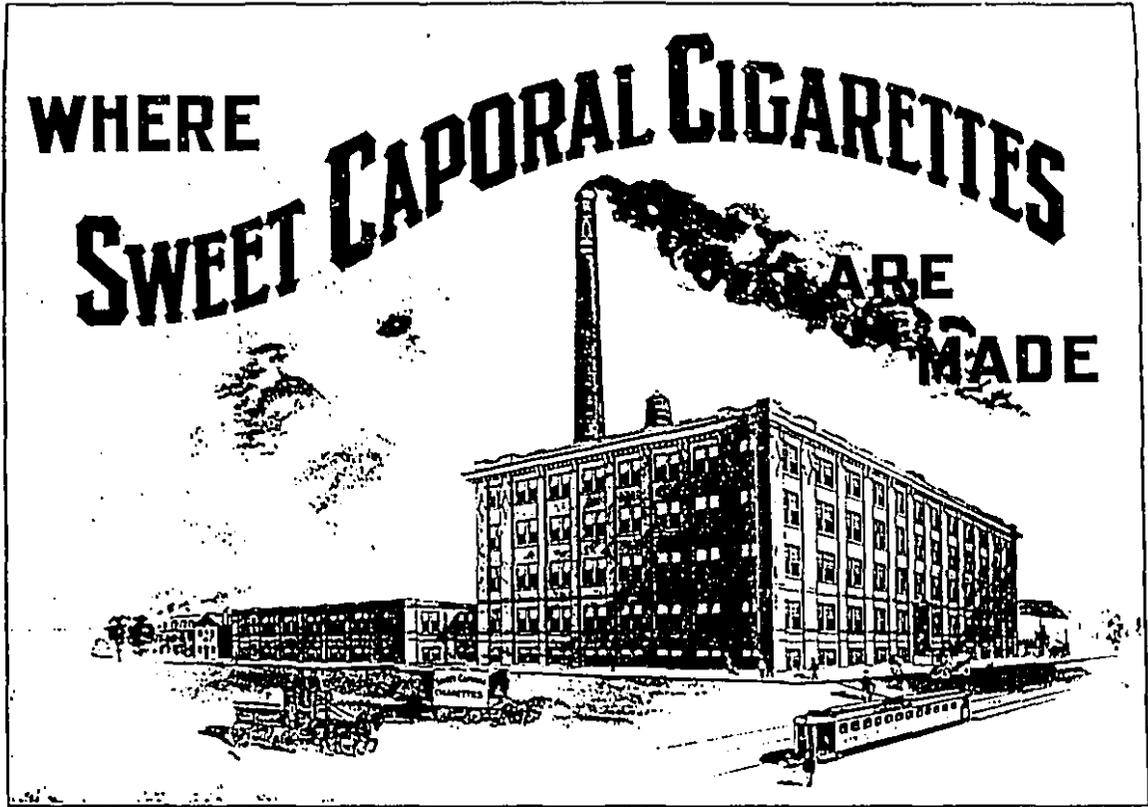
³⁰⁷ For a detailed examination of American Tobacco's distribution practices see the testimony given before the Royal Commission into their business methods held in 1902.

strategies. When American Tobacco first arrived in Montreal it was set up in the heart of Old Montreal. By 1907 it had moved three times: each time into a bigger establishment further out from the city core. Its final resting place was newly annexed Saint-Henri, where the buildings on Saint-Antoine street "are the finest in Canada ... and constitute the largest tobacco factory in Canada" (Figure 6.15). The writer continues in typical tone of the booster, "this set of buildings form the most perfect example of monolithic construction in the world."³⁰⁸ It should be noted that the move of Imperial to Saint-Henri does not appear to have been directly motivated by the introduction of new technologies nor by the creation of new sets of internal economies of scale. American Tobacco had been using Bonsack machines from their establishment in Montreal, while its acquisition of Ritchie and American Cigarette in 1895 gave it a very strong hold on the Canadian cigarette market.³⁰⁹ The move would appear to be motivated by a number of other factors: the need to expand its premises to keep up with and to capture more of the rapidly expanding cigarette consumption; a desire to consolidate its position as the largest tobacco manufacturer in Canada through its showcase, "the most perfect example of monolithic construction"; and the need to create a more efficient plant for the mass production of cigarettes through mechanization. As one writer stated, cigarette machines "are now complicated and ingenious, and are tended generally by a man operator and by

³⁰⁸ Canadian Cigar and Tobacco Journal, July 1907, p. 57.

³⁰⁹ By the turn of the century American Tobacco's Montreal factory was producing about one hundred million cigarettes a year. See J.K. Winkler, Tobacco Tycoon: the Story of James Buchanan Duke (New York: Random House, 1942), p. 130.

FIGURE 6.15
IMPERIAL TOBACCO BUILDING, SAINT-HENRI, 1907



Source: Canadian Cigar and Tobacco Journal, July 1907, p. 57.

several girls, whose duty is chiefly to remove cigarettes, which are constantly streaming out."³¹⁰ Saint-Henri offered significant advantages for firms like Imperial. The new building differed quite dramatically from other buildings it had previously occupied which were the typical 'warehouse' structures favoured by smaller firms. The new building by 1918 covered more than 200,000 square feet (almost four times the size of its space in its last factory on Côte street).³¹¹ The layout was different: the Saint-Henri plant was much longer to allow for greater efficiency in the flow-through of material demanded by the Bonsack machines. At the same time, Saint-Henri had important transportation facilities (the Canadian Pacific's Glen Yards, railway lines and the Lachine Canal) which allowed for easy and rapid distribution of the finished products and the receiving of raw materials. Furthermore, it contained a large working-class population from which to draw. In the case of Imperial, with its large female work force, Saint-Henri had a large pool of women who probably needed to supplement the low wages that husbands or fathers brought home.

The development of the paint industry and the arrival of Sherwin-Williams plant close to the Lachine canal, the introduction of continuous-processing machinery in the cigarette branch of the tobacco industry, and the growth of a large iron and steel plant are indicative of one strand of the western suburbs' industrial development, the clustering of large-scale, capital-intensive, and high-volume firms

³¹⁰ Although this description comes from a review of British cigarette-making methods there is no reason to believe that it differed from the Imperial case in its broad outline. See Canadian Cigar and Tobacco Journal, September 1907, p. 53.

³¹¹ City of Montreal, Rôle d'évaluation, Saint-Lawrence ward, 1906 and Saint-Henri ward, 1918.

employing a mass of unskilled workers. This of course is what many writers have pointed to as the classical process underlying suburban industrialization in the period of corporate capitalism. It was the large, capital-intensive firms that were able to divorce themselves from the city core through the construction of internal economies of scale, that fled to the urban fringe. What I have shown here however points to the wide assortment of different productive strategies that existed between these large-scale firms. The Montreal Rolling Mills, despite its scale and capital inputs, remained committed to the coexistence of elaborate technologies and skilled, manual labour, and to the production of a wide range of products. Imperial Tobacco, in contrast started off as a mass-production manufacturer utilizing high-volume machinery operated by a largely female and unskilled labour force. The other large firms - flour mills, other chemical factories as well as Sherwin Williams, textile mills and biscuit makers - that set up their plants alongside or in close proximity to the canal, while being motivated by a different set of factors, would have understood the benefits of locating in the western suburbs.

Agglomeration in the western suburbs

An important feature of the western districts' industrial growth was that these large firms acted as a magnet for firms from their industries. Lauzon and others are probably correct in stating that there were few direct physical linkages between the firms in the western suburbs³¹², but this was not necessarily important, although

³¹² Lauzon, "Le développement industriel"; Ouellet, "Rapport de recherche".

metal firms may have obtained rolled metal from the Montreal Rolling Mills, and the textile mills may have received finished cotton from Merchant Manufacturing. Many firms in the district received their raw materials from outside sources: Montreal Rolling Mill obtained its iron from Nova Scotia and Britain; the Colonial Bleaching and Printing Co. obtained cotton for its bleaching and dyeing rooms from Britain, Europe, the United States as well as Canada³¹³; Sherwin-Williams got oxide and graphite from its mines in western Canada; and the Dominion and St. Lawrence flour mills received wheat from the prairies. At the same time, these firms also internalized many of their operations, either by setting up their own nail works, and coopering and blacksmithing shops as did the Montreal Rolling Mills or through integrating vertically, as in the case of the Colonial Bleaching Co. and Merchant Manufacturing.

Despite the scale and lack of direct linkages, the western suburbs became an important district for medium sized firms which functioned within specialized niches in those sectors which had large-scale, corporate firms already in existence. Two sectors stand out. Following in the wake of Merchant Manufacturing and the Montreal Rolling Mills, several textile and metal-working firms moved to the West End. By 1918 the metal-working cluster in the West End was quite impressive: as Table 6.11 shows there were thirty-three firms, none of them having the same scale and importance as the rolling mill, but many, nevertheless, were of a substantial size. These metal-working firms manufactured a wide range of products: from metal

³¹³ Chambers, The Book of Montreal, p. 197.

lamps, regulators, valves to wire meshing. An extremely important firm that was established early was the sewing-machine firm of Williams Manufacturing Company. It was established in 1861 in Montreal "by a few enterprising and energetic gentlemen as a private company, and as such was continued until 1872, when a Joint Stock Company was formed with a capital of \$500,000". By the late 1870s, when the company moved to Saint-Henri, the capital had been increased to one million and a branch plant established in Plattsburgh, New York. Employing 150 workers in the 1880s in its four-storey building which covered 60,000 square feet, the company utilized the "latest and most improved machinery" known in the industry.³¹⁴ When Robert Mitchell moved his brass foundry to Sainte-Cunégonde from Old Montreal in 1889 he was able to build a huge four-storey building with dimensions of fifty by four hundred feet. The choice of a large site where he could construct a finely segmented work space and with access to a labour force were powerful incentives for a company that had a national market for its products.³¹⁵

Although the textile cluster was not as large as that in metal, firms specializing in blanket and shoddy, bedding, wadding, cotton bleaching and bags all had settled in the western districts by the early years of the twentieth century for the purpose of building large factories within a productive space characterized by the existence of a large labour force which had acquired the correct 'industrial habits', access to transportation facilities, and freedom from the economic and social problems of the

³¹⁴ Bray, Canada Under the National Policy, p. 117; Commerce of Montreal, pp. 45-46.

³¹⁵ The Dominion Illustrated, 1891, p. 133.

core. Manufacturers moved to the West End knowing full well that the local bourgeoisie were ideologically aligned with a policy that put industrialization before the interests of the local working-class. It was to gain access to these conditions that the Alaska Feather and Down Company, manufacturers of bedding, which was established in a small and cramped flat on Saint-Sacrement street in the heart of Old Montreal, moved to Saint-Henri in 1894. In the following years the company expanded greatly. In 1903 the space that it occupied was almost ten times what it had on Saint-Sacrement street, while by 1918 the factory covered almost four acres.³¹⁶

While the western suburbs proved to be an important location for metal and textile firms, enterprises from other industries also found its advantages to their liking. One reason was that they were able to build factories that suited their particular needs in terms of the internal layout of the firm and the provision of land which could be built upon in times of expansion. In other words, firms were not limited by the existing built form as were firms which located in the core. Even for firms that relocated in an existing building there were advantages. When the leather trunk and valise manufacturer, Eveleigh, moved from its Montreal plant on Vitre street in 1910 to an existing factory in the north end of Saint-Henri on Richelieu street it was able to expand its premises greatly. In 1906 it occupied under 14,000 square feet on Vitre street, while six years later its Richelieu plant had more than 94,000 square feet; the value of the two buildings increased from \$23,000 to \$73,000. The company also probably installed new and large sets of machinery as the value

³¹⁶ Chambers, The Book of Montreal, p. 186.

of the machinery increased from \$500 at the Vitre street plant to \$3,000 at its Saint-Henri establishment.³¹⁷

The western suburbs, tax exemptions and local alliances

Behind the flow of industrial capital into the western suburbs were local municipalities which were as generous and malleable as the councillors of Maisonneuve. As we saw above, the municipalities of the western suburbs were extremely active in shaping policy towards the benefit of manufacturers. Local elites in association with several Montreal capitalists had, from as early as the 1860s, formulated an impressive array of attractions. The provision of bonuses and tax exemptions, the development of lax housing codes, and the construction of infrastructures which were geared to manufacturers at the expense of the local working-class population made the western suburbs extremely competitive not only with Montreal but also with other surrounding towns. Through the actions of the their local growth machines, Saint-Henri and Sainte-Cunégonde had become by the 1870s an important industrial complex in the wider Montreal spatial division of manufacturing. An important part of this growth on the western fringe of the city was that many of the firms that moved to the western suburbs had been first located in Montreal (Table 6.12).³¹⁸ Saint-Henri and Saint-Cunégonde, in particular, became important recipients of firms which, for a variety of reasons, no longer found

³¹⁷ City of Montreal, *Rôle d'évaluation*, Saint-Louis ward 1906 and Saint-Henri ward 1912.

³¹⁸ Both Lauzon, "Le développement industriel" and Ouellet, "Rapport de recherche" remark upon this.

TABLE 6.12
 FIRMS THAT MOVED FROM MONTREAL TO THE WESTERN SUBURBS,
 1850-1918

Year Moved	Company	Products	Town
1862	E.E. Gilbert	stoves	Sainte-Cunégonde
1869	Davidson	tinware	Sainte-Cunégonde
1875	Luttreil	biscuits	Sainte-Cunégonde
1876	Ecroyd	leather	Saint-Henri
1879	Williams	sewing machines	Saint-Henri
1883	McCaskill	paint and varnish	Sainte-Cunégonde
1885	Dominion Wadding	wadding	Sainte-Cunégonde
1886	Rutherford	sash and door	Sainte-Cunégonde
1888	Godin	hats	Côte Saint-Paul
1889	Mitchell	brass products	Sainte-Cunégonde
1894	Clendinneng	iron products	Sainte-Cunégonde
1894	Alaska Feather	bedding	Saint-Henri
1894	Tombyll	furniture	Saint-Henri
1900	Tooke	shirts	Saint-Henri
1901	Lang	biscuits	Saint-Henri
1902	Montreal Biscuit	biscuits	Saint-Henri
1903	Pauzé	sash and door	Saint-Henri
1903	Simplex	railway supplies	Saint-Henri
1904	Victor Talking	gramophones	Saint-Henri
1905	Baker, Walt	chocolate and candies	Saint-Henri
1906	Imperial Tobacco	cigarettes	Saint-Henri
1910	Everleigh Trunks	leather trunks	Saint-Henri
1911	Globe Hat	hats	Saint-Henri
1913	Kidd Rutherford	jute bags	Saint-Henri

Source: Lovell, City Directory, various years; Ouellet, "Rapport de recherche", Tableau 3, facing p. 18.

Montreal a fertile place for business. Many of the large firms that settled in Saint-Henri and Sainte-Cunégonde were escaping problems associated with their location in Montreal. Some may have been fleeing the imposition by Montreal of taxation on machinery that was introduced in 1899, although this is unlikely to have been important for most firms. There were other reasons that firms were attracted to Saint-Henri and Sainte-Cunégonde such as the bonus system and a business climate that was open to industrial development; the existence of a number of empty sites where firms could install machinery and build the type of plant geared to their particular needs; a cheap and accessible labour force; and excellent transportation connections with the rest of the city.³¹⁹ In other words, there had been created in the western suburbs a particular set of productive spaces that were extremely attractive to not only new firms but also to firms already in operation in Montreal, and had been in existence since the establishment of the Montreal Rolling Mills. From an early date, firms were uprooting themselves and moving lock, stock and barrel to the western suburbs.³²⁰ Many of these moves were associated with some form of rationalization. The move of Dominion Wadding from Sorel to Sainte-Cunégonde in 1885 was associated with the fact that "the most improved machinery is installed in their premises, and the most modern methods are employed, a fact

³¹⁹ It should be noted that the provision of bonuses must have been an important part of the financial debt incurred by Saint-Henri and Sainte-Cunégonde which led to their annexation in 1905.

³²⁰ It should be noted that the movement of firms from Montreal to the western suburbs became a flood immediately after World War I and during the 1920s. A preliminary list includes Masson and St. Germain, biscuit mfr (1918), Page and Shaw, candy maker (1920), W.T. Rawleigh, medicine makers (1924) Danford Bros., thread maker (1925), George Weston, biscuit maker (1926), Atlas Metal Bed (1926), and Thomas Bonar, bag maker (1926).

which has greatly reduced the cost of production, and consequently the selling price, in their market."³²¹ Likewise, the biscuit and confectionery manufacturing firm of Joseph Luttrell and Co., in order to facilitate changes to their production methods which were made possible by reorganization of the biscuit branch of the baking industry, moved to Sainte-Cunégonde in 1875 where new "spacious buildings" were fitted up and even though, "situated beyond the city limits, they are accessible by the telephone or the city cars which run to Vinet Street on Notre Dame Street; and from this situation they claim that they can produce at less cost than city manufacturers".³²²

Of course, the western suburbs faced stiff competition from a number of other neighbouring towns and, in some cases, even Montreal. In 1905, for example, Simplex Railway Company, a producer of railway supplies such as bolsters, brake beams and bearings, left its Saint-Henri plant and moved to a new building in Lachine which was double the size of its original plant.³²³ In the early 1890s, McCaskill Varnish completely reorganized its system of making varnish and in the process moved from the western suburbs to "a special factory" built in Montreal.³²⁴ William Clark, a manufacturer of prepared meats moved their factory from the corner of Albert and Vinet streets in Saint-Cunégonde in 1883 to a canal site in Point Saint-Charles,

³²¹ Chambers, The Book of Montreal, p. 186.

³²² Industries of Canada, p. 172.

³²³ Canadian Manufacturer, June 2, 1905; Chambers, The Book of Montreal, p. 212.

³²⁴ Chambers, The Book of Montreal, p. 235.

presumably to be closer to the area's slaughter yards. While the western suburbs were losing firms to neighbouring towns and Montreal, they also had to battle other municipalities for the privilege of attracting manufacturers in the first place. In 1903, for instance, Saint-Hyacinthe granted a bonus to the large Montreal boot and shoe firm of Ames, Holden who then moved the manufacture of their staple goods to the town, while retaining the making of their special lines and higher grades at their Montreal factory³²⁵; while Abbott Rolling Mill, five years earlier, moved their entire plant and machinery valued at \$250,000 from Montreal's east end to Kingston, Ontario after the latter town had offered them a free site and a bonus of \$50,000.³²⁶ Closer to Montreal, municipalities like Lachine were offering companies such as George Barrington and Sons, the trunk makers and James Cooper and Co., railway suppliers, grants of \$15,000 and \$35,000 respectively.³²⁷ The threat of competition did not end there. Even in Montreal, some people were attempting to establish a bonusing system. As one critic of the plan stated, however,

if this great city, the chief seat of Canadian manufacturing enterprise, cannot get along without giving annual bonuses to factories, it had better lower its flag to the level of the small municipalities that compete with each other for a blacksmith's shop. ... Montreal is not a hospital for decrepit industries.³²⁸

³²⁵ Canadian Engineer, February 1903, p. 47.

³²⁶ Canadian Engineer, January 1898, p. 274. There was often specific demands attached to the receiving of a bonus. In the case of Abbott Rolling Mill, the Kingston city council demanded that the company carry on business for twenty-five years, employ as many as 200 workers by the end of the second year, and stay open 275 days a year.

³²⁷ Canadian Engineer, August 1898, p. 114, July 1900, p. 63.

³²⁸ Canadian Journal of Commerce, May 20, 1892, p. 863.

It was in this type of environment that the western suburbs had to function: firms being pulled to the central metropolis and to the more far-flung towns of the region. Some firms such as the Montreal foundry Clendinneng would move to Saint-Henri "on condition that a bonus is granted... of a free site of not less than 10 acres and exemptions from taxation for 20 years." It was argued that an important manufacturer such as Clendinneng while providing employment for 450 workers would also have the effect of causing the town's population to grow by 300 to 400 and increasing the "value of house and other property in the locality".³²⁹ Despite the vocal opposition of some of Saint-Henri's important property owners such as ex-Mayor N. Trudel who thought the terms too high, the bonus was passed.³³⁰ Two years later, Clendinneng had constructed a building 500 by 500 feet and valued at \$100,000 in the core of Saint-Henri's manufacturing area.³³¹ Bonuses could also be extended to firms already in the locality and to bring in important infrastructural networks. The large Montreal shirt manufacturer, Tooke Bros., received a \$35,000 bonus in 1899 to move to Saint-Henri.³³² In 1892, Côte Saint-Paul granted a \$10,000 bonus and a twenty-year tax exemption to the Canada Axe and Harvest Tool Manufacturing Co.³³³ A year later, so that "the factory town ... [could] have railway

³²⁹ Canadian Journal of Commerce, August 19, 1892, p. 293.

³³⁰ Montreal Gazette, Tuesday, August 16, 1892, p. 3.

³³¹ Canadian Engineer, June 1894, p. 60.

³³² Canadian Journal of Commerce, April 21, 1899, p. 564.

³³³ Canadian Journal of Commerce, October 14, 1892, p. 602.

communication with the city", it presented the Grand Trunk Railway with a \$15,000 bonus and a twenty-year tax exemption.³³⁴

By the turn of the century the western suburbs were firmly caught in the web of Montreal's industrial and urban fabrics. They were a rationalized set of productive spaces close to the "great lines" of the city which served a different purpose from the city's other industrial districts. They were districts built upon the establishment of large and medium-scale firms pursuing a range of production formats: some like the cotton mills operated a highly mechanized, high-volume production process producing basic lines for a national market and employing a large unskilled workforce, while others had more specialized markets and depended on a greater range of skills. Despite the differences, the firms had one thing in common, the need for space which could accommodate their demands. Some of the needs were for basic geographic facilities such as transportation facilities and large sites, but more important were the actions of the local bourgeoisie which created a malleable and flexible set of spaces regardless of the costs - heavy debts, environmental degradation, lack of essential services and little control over housing conditions. From as early as the 1860s the western suburbs had become a specialized district within the wider context of Montreal's spatial division of labour. This, however, was not inevitable; it depended on several forms of capital acting together to create new productive strategies and productive spaces: the Montreal hardware merchants who saw corporate growth as a means to solve their supply problems; the small textile and

³³⁴ Canadian Journal of Commerce, January 13, 1893, p. 50.

metal manufacturer who for a variety of reasons needed to escape the confines of the core; and the local elites who through the promotion of industry were able to establish their own little kingdom and substantial profits.

CHAPTER 7 CONCLUSION

7.1 The Problem and the Argument

The aim of this thesis has been, using Montreal as a case study, to see how urban space between 1850 and 1918 was reorganized so as to make it profitable for industrial capital. My major preoccupation has been to identify the dynamics associated with the formation of urban industrial districts and the specialization of industrial space in a period when production has generally been viewed as centralized in the city core.

My theoretical approach arose out of dissatisfaction with the historical application of prevailing approaches to urban industrial geography. As shown in Chapter Two, classic discussions of the location of industry in the North American city in this period suffer from major weaknesses: their reliance on narrow and polarized conceptions of industrial organization, their inability to take account of cycles of investment, and their neglect of the social construction of the built environment.

To reformulate the question of the making of industrial space, I have addressed three questions. In what ways can the identification of the diverse range of productive strategies open to industries enable us to capture a better understanding of the changing historical geography of capitalism? What was the relationship of these strategies to the rhythm of changes to technology, the labour process, and the organizational structure of firms? How do the actions of local growth machines mediate the process of the formation of industrial space?

In order to gain some insights into these questions the argument presented

here took two major directions. The first was to show, in contrast to the prevailing view in the literature, that new, specialized and important non-central manufacturing districts were evident on the urban landscape from as early as the mid-nineteenth century. The second was to identify the forces that account for the emergence of the several large manufacturing complexes within cities.

The questioning of prevailing theories generated methodological issues that have been ignored or glossed over in the existing literature, such as the scale of analysis, the role of case studies, and the definition of industry. My methodological fuses 'extensive' with 'intensive' research strategies. One strand of this methodology has been a description of Montreal's industrial geography for two years (1860 and 1890) through the collection of the annual rent data for each manufacturing firm from the City of Montreal and surrounding suburban rôles d'évaluation. Rather than relying upon gross spatial units (wards, or the dichotomy of city and suburb), as has been the custom in urban industrial geography, I constructed Montreal's industrial geography from the bottom up: individual firms were aggregated by 'cells', which were allocated to 'districts', which were in turn collapsed into 'zones'. I was then able to move from one spatial level to another according to the question I was seeking to answer. This strategy provided a description of the patterns of location of manufacturing firms at the two dates and demonstrated that Montreal had a specialized and differentiated pattern of industrial land-use as early as the 1850s. This compilation was not enough to explain the patterns and the processes involved. To move toward explanation, I worked from the literature of economic restructuring

and urban development, to derive 'entry points' for empirical analysis. I see these entry points - the concepts of production formats and industrial space - as critical for the understanding of the industrial geography of Montreal and applicable in other cities and other periods of time.

7.2 Social Divisions of Manufacturing

The problem of simplistic conceptions of industrial organization led me to adopt a historically-based body of concepts regarding the organizational structure of industry in this period of 'competitive capitalism' and the beginnings of 'corporate capitalism'.¹ I show the polarization between large and small, labour and capital-intensive industries, which plagues prevailing theories, to be a weak foundation for an analysis of urban industrial structure and industrial geography. To escape these constraints, I developed in Chapter Three the concept of production formats. Social and material properties of firms and industries are disaggregated to show the variety of ways in which that industrial structure was organized. Neither the urban production-system nor the structure of most industries conformed to the classic polarity of small-scale, labour-intensive firms and large, capital-intensive firms. If we recall the case of the clothing industry, it developed quite differently from the cotton and metal industries because of the contrasts in the extent and application of

¹ When I talk of 'simplistic conceptions', I am referring mainly to work in geography, sociology and economics where the interest in models and generalizations has led scholars to forsake more nuanced pictures of urban and industrial phenomena. As I have noted throughout the thesis, especially in Chapter One, historians because of their commitment to more intensive research questions and methodologies have presented a more complex and varied picture of the workings of industry in this period.

machinery, the social relations of the labour process (especially the division of labour by gender and ethnicity, and control over the work process), and the organizational possibilities of the industry. The clothing industry was extremely heterogeneous in terms of internal organization. By the second half of the nineteenth century it was characterized by at least three different production formats: the small shop which featured a small number of workers and produced for a local market; the large factory characterized by a highly developed division of labour, sophisticated distribution, and large amounts of machinery; and outwork, organized by wholesale manufacturers who maintained a small and select labour force at the factory and put out most of the sewing to women in the surrounding countryside.

Production formats are a contribution to the literature of industrial geography because theoretically and empirically they emphasize the different trajectories open to firms and industries. The format approach enables scholars to examine the historical features and the dynamics of industrial organization without relying on generalized models whose strength is description and not explanation. Intensive examination of different firms and industries highlights the problems associated with conventional views of industrial organization, economic growth and the spatial division of labour in this period. One such problem is related to the point made by most scholars that urban growth is driven by a set of growth industries. While this is partly true, it is necessary to unravel the several strands that constitute growth sectors. Firms in the metal sector, for example, in the second half of the nineteenth century employed a wide range of productive strategies: the Montreal Rolling Mills

was highly-capitalized and corporate-controlled, while certain foundries and metal-working firms specialized in a particular line (the lead pipe factory of James Robertson) or serviced ancillary industries such as the railroads (the Vulcan Iron Works and B.J. Coghlin's foundry), and small blacksmith and machine shops had a distinctive niche, catering to the everyday needs of a wide range of consumers. The baking industry likewise was composed of a bread-making branch which relied heavily upon traditional forms of production, while the manufacture of biscuits and crackers underwent tremendous changes in the form of mechanization, the labour force and distributional methods. These cases illustrate that the concept of production formats provides a valuable means which which to highlight the diversity of industrial organization and to unravel its various strands.

Changes to technology have been viewed by most writers as being the decisive force behind the emergence of bursts of economic activity and the associated movement of industrial capital within the city and the wider region. These writers emphasize the rapid diffusion of technologies from leading sectors to the rest of manufacturing. Allied with this is the notion that growth industries were the leaders in the movement of industrial capital after World War I from the core to the periphery. One of the contributions of my research to this literature is to show that this perspective needs to be modified in several places. Building on my argument about production formats, I demonstrate in the empirical chapters that, although Montreal's growth industries in the mid-nineteenth century were active in the implementation of new technologies, they also had to contend with severe difficulties

in the installation of technology. The metal, cotton, tobacco and shoe industries, for example, were constrained from the full implementation of their technological potential by the small size of the Canadian market. They faced problems with the functioning and the cost of machinery, the inefficiencies of the continual setting-up of machinery, and the inadequacies of existing buildings. At the turn of the century, a new set of problems appeared and demanded a different set of responses: overproduction as a result of the introduction of technology led to mergers and other forms of combination in the case of many industries such as cotton, while the attempt to raise productivity of existing machinery led the Canadian Pacific Railway to implement scientific managerial methods of production at its Angus car shops.

While the evidence for Montreal suggests that we should seriously question the ability of firms in some leading sectors to introduce new machinery, the degree to which technology was the critical factor in the evolution of others is also debatable. What my research suggests is that the division of labour associated with the different trajectories taken by many industries was as critical to the formation of manufacturing complexes as was technology. The evolving social division of labour that characterized Montreal was a product of the breaking-down of tasks within the workplace and differentiation of tasks among firms. Again, a wide range of responses appeared on Montreal's industrial landscape. In industries such as clothing, cigarmaking and shoes an elaborate division of labour was implemented long before the introduction of machinery. In the metal industry, in contrast, an elaborate division of labour was harnessed to mechanization and to other technological

innovations, as well as to a significant degree of control by skilled workers over production. These industries stand in contrast to the cotton and cigarette industries where a full-fledged mechanized, high-volume, continuous-processing production system was in place from the beginning. Thus, the intensification of the division of labour was as important as technology in the creation of production formats.

Another issue that I tackled in the thesis was the impact of cycles of investment upon the structure of industry and formation of industrial districts. Theories of urban location have neglected to incorporate cycles of boom and bust. What I show in the dissertation is that each burst of economic change introduced new technologies and new sectors to the production complex, and highlighted the inadequacies of existing industrial spaces and established the need for the creation of new ones. These changes occurred within the broad lineaments of long waves of growth. The structural homogeneity associated with the high degree of abstraction of long waves provided an important role in identifying the broad tendencies of economic growth. When research was undertaken at a more detailed level, however, a diverse set of possibilities from which industries and firms could draw were identified. In other words, the broad generalizations of long waves while providing scope for understanding the larger processes of change, also allowed research to be conducted at a more intensive level of abstraction where the specifics of particular production strategies could be acknowledged.

One element of the long wave after 1850, for example, was the generalization of steam power and specific forms of machinery. Throughout the second half of the

nineteenth century, however, these were hitched to the clothing and textile industries in quite different ways. In other words, each cycle was associated with a different array of productive practices. Lastly, each cycle was a response to the contradictions of the preceding cycle. As the advantages initiated at any one time became redundant at a later period, new modes of organizing production became necessary. This did not mean the timing of changes in industries and the urban production-system were synchronized in a precise manner, although business crises were a means for firms and the production system as a whole to restructure the various parts. The result was that the events in successive cycles overlapped with one another, producing a coexistence of different technologies, labour process and organizational structures.

Although I have not explicitly discussed the question of flexibility, there is little doubt from what I have shown in this thesis that firms and industries in this period displayed great flexibility in the type of strategies that they undertook. Some dimensions of this can be noted: the specialization of industries into separate pieces of the wider urban production-system; the flexibility that industrial branches and firms undertook in juggling the various components of their production process; and the flexibility associated with the making of work spaces, at both the urban and firm level. At the level of the urban production-system, the ability of manufacturers to implement a wide range of productive strategies was impressive. A truly diverse set of combinations of machinery, skills, products, gender and ethnicity was constructed; even though primary metal, cotton and cigarette manufacturers followed relatively similar paths of development there were significant differences between them. Their

production formats differed from industries such as carriagemaking, shoes and baking. They also differed among themselves. Within the clothing industry, for example, some manufacturers undertook inhouse production, others outwork or custom-tailoring. Printers opted to specialize in job printing, book and newspaper publishing, or large government contracts. Baking manufacturers chose to take up a variety of choices from the baking of bread with traditional methods or the manufacture of biscuits using the latest mechanized production systems; and cigar makers developed in ways quite different ways from tobacco or cigarette manufacturers.

7.3 Spatial Divisions of Manufacturing

In this thesis I make two contributions to the literature of industrial geography. The first is to provide a set of theoretical statements concerning the role of technology, division of labour, cycles of boom and bust, industrial linkages, and local alliances in the development of industrial space. The second contribution is the empirical examination of the evolving industrial geography of Montreal, and by implication of its social geography. One argument of this dissertation is that the notion of different trajectories of industrial evolution has several implications for the formation of urban industrial geography. Through the empirical research undertaken in this thesis I was able to dissect prevailing theories and reformulate the development of urban manufacturing complexes.

A major contribution has been to identify, empirically, the succession of

industrial districts that were built in Montreal from the mid-nineteenth century to the early years of the twentieth century. Starting in the late 1840s, new productive spaces were built along... a broad front of growth: the most important were strung out along the Lachine canal in Saint-Ann ward, another in the East End in Sainte-Marie and Hochelaga. By the end of the century, as this long surge of growth was drawing to an end, and as the contradictions of its institutional and technological bases became apparent, it became necessary for new firms and those whose growth was restricted by their existing location, to develop new industrial spaces. By 1900 the western suburbs of Côte Saint-Paul, Saint-Henri and Sainte-Cunégonde had become important industrial districts, followed a few years later by the eastern suburb of Maisonneuve.

A distinguishing feature of Montreal between 1850 and 1918 was the malleability of its space, allowing for the construction of a great variety of industrial spaces. In Weberian and transactional perspectives, the formation of industrial space is seen as fixed by the over-riding reliance of firms of all types upon external economies and the unsophisticated form of technologies in the nineteenth century. In contrast to that perspective, I show that after 1850 the internal pressures of industry and the actions of local growth machines were responsible for the creation of new industrial spaces. These spaces were differentiated as part of a grander division of manufacturing in urban space as a whole. This was possible only because Montreal's space could be continually moulded and reconstituted in different forms. As a consequence, urban industrial districts varied in terms of the number and

density of establishments, the mix of industrial sectors present, their dominant production formats, and their relation to labour and housing markets. Each district had its own character which it maintained over a long period of time: Saint-Ann, for example, retained its concentration of metal-working firms and its large share of large firms. Small and medium size firms, dependent upon the agglomeration economies continued to cluster in Old Montreal and, later in the nineteenth century, in the Outer Core. Numerous small firms developed in a select set of industries around the large rubber factory and brewery in Sainte-Marie. But districts differed with respect to their dynamics: they grew at different times and at different rates, and they differed in the features which attracted or retained firms.

The malleability of urban space brings into question the generally accepted conception of a transition from 'mercantile' to 'industrial' city and from 'industrial' to 'corporate' city between 1850 and 1918. These stages are predicated upon the assumption that the three urban forms had three industrial geographies: the mercantile is said to have no significant industrial clusters; in the industrial city all industry is concentrated in the city core; and the transition to the corporate city is characterized by the move of large chunks of industrial capital to the suburbs. For Montreal this was not true, and I am prepared to argue that Montreal is representative of most other large cities of its time. I am not suggesting that all cities followed the Montreal 'model'. But following the logic of my argument presented in this dissertation about productive strategies and the formation of industrial districts, I would suggest that cities such as Toronto, Boston, New York, Pittsburgh, Chicago

and Philadelphia would have had a much more complex industrial geography than conventional approaches would suggest. Large chunks of capital were implanted on the urban periphery by as early as the 1850s, witness the rolling mills and food processing factories along the Lachine canal, and the rubber factory and brewery in Sainte-Marie. By the 1880s peripheral sites were developed by Montreal merchants for the cotton mills in the West and East Ends, while the large railway car shops took advantage of the urban fringe in the early twentieth century.

From the mid-nineteenth century large manufacturing enterprises were on the look-out for new non-central sites. Firms were always searching for ways to reduce costs, and one way of achieving this was relocation for existing firms and the move by new firms to new areas. Insofar as firms were attempting to cheapen the costs of production through the introduction of new technologies, new labour processes and new production practices, they needed to create new industrial spaces where existing institutional networks would facilitate and not hinder the creation of new productive strategies. The facilitating factors, as I have shown, were inexpensive and malleable land, new infrastructures, more modern industrial buildings, and pliant local governments.

There is little doubt that in the Montreal case technology played an important role in the city's shifting spatial division of labour. This occurred indirectly through the effects of technical options on firms' demands for space and buildings, and their ability to generate internal economies of scale and scope. Among the examples I have provided are the large-scale, highly mechanized firms which initially located in

districts far from the city core, like the cotton mills in Hochelaga and Saint-Henri. Others abandoned their sunk capital in old districts and relocated to new sites on the periphery, notably the moves of shoe firms to Maisonneuve and the flight of firms from Montreal to the western suburbs. Grothé and Davis cigar factories moved to the adjacent districts of Outer Core. The creation of new industrial spaces would provide advantages for firms free to relocate. As we saw with the movement of shoe firms to Maisonneuve, one advantage of the new industrial district was the opportunity bound up with the set up of a new plant layout. The internal space of the firm could be moulded to take account of new machinery and new sources of power, the separation of labour force segments, and lay-out of efficient paths for transport of materials through the factory. This kind of reorganization had been going on since the mid nineteenth century: I document the movement of flour mills and nail factories to the Lachine canal in the 1850s, the removal of Macdonald Tobacco to Sainte-Marie in the 1870s and Imperial Tobacco to Saint-Henri thirty years later. Whatever the differences, all these firms were seeking new production places in order to implant new productive practices. Meanwhile, some firms, by their large-scale investments in machinery, equipment and buildings were compelled to undertake different strategies. Because of the fixed capital relocation was not an option. Instead of the mobility that characterized many firms and industries, some firms remained fixed in space: the Grand Trunk Railway, for example, frequently reorganized, refurbished and expanded its shops at the original site in Point Saint-Charles. In other cases, despite relatively advanced mechanized systems and an

elaborate division of labour, industries such as printing and clothing remained rooted to the central core.

These industries did not opt to relocate because of certain fixed locational requirements. Market-oriented industries such as printing, carriagemaking and clothing are classic examples of industries which had to remain in the core. In order to expand and modernize, they had to find a different mode of creating new production spaces. In the clothing industry, for example manufacturers could choose from a wide gamut of productive choices, but even the largest firms, employing quite sophisticated forms of mechanization, adapted locations close to their suppliers, their markets, and fashion networks centred in Old Montreal. As the century drew to a close, there was some movement of firms from these industries to other industrial districts. About 1900 the larger cigar manufacturers moved from the old warehousing district to the Outer Core where they could build new industrial spaces which were larger in scale, segregated workers from each other, and allowed for more effective movement of products through the plant. At the same time, large-scale vertically-integrated clothing manufacturers like Standard Shirt, Tooke Bros. and Peck moved their plants to the peripheral districts of Sainte-Marie, Saint-Henri and Mile End respectively.

One element of the ability of firms to find new locations was the initial development of 'magnet' firms in areas that had little industry. In all the districts that I studied, the early establishment of a large, technologically sophisticated firm initiated the formation of an extensive manufacturing complex. The move of the

Montreal Rolling Mills to Sainte-Cunégonde or the Saint-Lawrence Sugar refinery to Maisonneuve in conjunction with the policies of local governments, for example, galvanized an effective growth machine for the provision of working-class housing, subsidies to industry and infrastructures. What this suggests is that the nineteenth-century city was characterized by several networks of linkages with corresponding spatial forms. On the one hand, there were the well-known linkages of the city core where 'market-dominated' industries of all sizes were dependent upon external economies. On the other hand - and this thesis provides evidence for this - other kinds of linkages stimulated the formation of non-central industrial districts. Once a magnet firm was established, it set in motion processes which drew other firms with 'tactical flexibility' to cluster around it. Some were large enterprises, but not all. In many sectors there were firms which possessed this tactical option, because they controlled an innovation, because their markets were expanding or their capital investment was increasing. Given the wide array of productive strategies it is unlikely that all firms in an industrial sector would have been able to take advantage of the new locations. As a consequence, a magnet firm initiated the formation of a diversified industrial district. Firms were attracted not so much by the direct linkages (of suppliers or customer firms), but by the institutional conditions established in the districts, such as infrastructures and labour force.

While the constant restructuring of the social relations of production generated the basis for re-evaluating locational choices, creation of industrial districts could not have taken place without the activities of local growth machines and the

development of physical and social infrastructures. Although I have not been able to provide much new evidence of the tight networks formed by the local bourgeoisie, it is certain that local elites were responsible for laying down the physical, ideological and legal infrastructures necessary for industrial growth and a re-weaving of the urban fabric. These elites were deeply committed to the reproduction of the relations of place through defending existing capital embedded in the urban landscape. They were also dedicated to generating new urban resources through which they could privately profit and through which they could justify investment in infrastructures critical to their own enterprises. Growth machines were a tool for raising the velocity of capital circulation within the city. They constructed new infrastructures and remodelled existing ones, and in the process made possible the transformation of the built environment for industry.

Successive industrial growth machines employed different institutional devices. One of the best known is the tight group of land developers, manufacturers, and politicians who controlled the form and rate of development of Maisonneuve at the turn of the century. The development of new industrial districts did not necessarily follow the path that Maisonneuve did, with its regulation of zoning and public planning. The Lachine canal manufacturing complex that emerged in the late 1840s was launched by a round of new investment in an infrastructure that was built thirty years earlier for other purposes. The entrepreneur exercised control of industrial sites, working-class housing, and infrastructures which were developed in Saint-Ann. In Saint-Henri and Sainte-Cunégonde, local elites consciously implemented policies

aimed at enticing industry, and experimented with tools of bonussing, subsequently employed in Maisonneuve.

Despite the divisions between industrial spaces and the variations in the forces giving rise to them, the city as a whole was founded on a powerful set of connections between the several growth machines which re-configured the urban space. Their strategy for development of infrastructures, critical to accumulation of manufacturing capital was advantageous to merchants, retailers and the finance sector. There was a continuous clamour for "improvements" to connect Montreal with the outside world and to generate new linkages among parts of the city. The bourgeoisie who controlled the Harbour Commission, for example, through their connections with politicians, their industrial subsidies, and their land development, powerfully re-shaped the industrial geography of Montreal. The laying down of new industrial geographies was dependent upon networks established between different elements of Montreal society. The local elites of Saint-Henri, for example, had important connections with members of Montreal's bourgeoisie, who in turn, were linked to the wider national scene.

In this thesis I have shown that between 1850 and 1918 that a succession of industrial districts were built in Montreal. This was to continue in the following years and by 1929 new industrial districts had sprouted on the outskirts. Two important ones stand out. Mile End to the north along the Canadian Pacific Railway line first developed in the boom of the 1900s and by the time of the Great Depression contained a significant cluster of firms employing a range of productive strategies in

the paper, beverage, food processing, and chemical industries. The Mercier district to the east developed quite differently; it contained a few very large and highly capital-intensive firms (Shell Oil, Canada Cement and Canadian Steel). Three features characterize the persistent process of spatial reorganization of industry in Montreal between 1850 and 1918, and, I would suggest, for the following period. The first was the constant reshaping of the social division of manufacturing: changes to technology, the labour process and the organizational structure of industry were powerful forces behind the demand for new industrial spaces and the redevelopment of existing ones. The second feature was the hitching of cyclical movements of industrial investment to the redefinition of the locational coordinates of urban manufacturing. The last process was the mediation of local growth machines in the construction of the built environment and the pressures of industrial change.

APPENDICES

The following appendices contain more detailed information for the data collected from the various rôle d'évaluation used throughout the thesis. Appendix 1 lists all manufacturing firms by cell for 1861 and 1890 - using the Ville de Montréal, Service de l'Urbanisme, Utilisation du Sol, 1:1,000. The second appendix lists manufacturing firms for 1861 and 1890 by the descriptive name of the categorization found in the Standard Industrial Classification system. The last appendix presents manufacturing firms cross-referenced by industrial district and sector for 1861 and 1890. The sources used were the rôle d'évaluation for Montreal (1861 and 1890), Saint-Henri (1890), Sainte-Cunégonde (1890) and Côte Saint-Paul (1895).

APPENDIX I
LIST OF MANUFACTURING FIRMS BY CELL

District	1861		1890	
	No. of Firms	Total rent	No. of Firms	Total Rent
St Henri			2	3,504
St Henri			7	17,091
St Henri			7	1,215
St Henri			2	210
St Henri			14	25,304
St Henri			4	1,788
Other			2	760
Lachine	6	2,802	17	9,960
St Henri	1	100	52	31,722
Lachine	2	10,080	4	26,050
Lachine	21	10,710	39	39,580
St Antoine	19	1,730	71	17,770
Other			3	800
Lachine	11	14,940	8	17,150
Griffintown	53	11,062	67	41,360
St Antoine	122	27,162	244	155,700
St Antoine	3	114	40	17,170
Old Montreal	203	47,912	305	161,475
St Laurent	50	5,188	85	26,080
St Laurent	5	370	14	3,520
St Laurent			24	2,750
Plateau			3	200
Old Montreal	67	6,560	74	21,430
St Jacques	26	1,164	79	12,610
St Jacques	2	340	24	4,330
St Jacques			16	1,340
Ste Marie	22	6,702	16	24,810
Ste Marie	17	1,446	52	32,450
Ste Marie			28	6,880
Other			5	530
Ste Marie	1	100	23	10,850
Ste Marie			8	12,270
Other			3	6,500
Maisonneuve			7	1,070
Maisonneuve			2	480
Maisonneuve			1	20,600
TOTAL	631	148,482	1,352	757,309

APPENDIX 2
LIST OF MANUFACTURING FIRMS BY SIC

Industry	1861		1890	
	No. of Firms	Total Rent	No. of Firms	Total Rent
FOOD				
Meat			8	20,166
Vinegar and Pickles	1	200	5	2,320
Flour	4	8,820	4	12,220
Baking	74	6,906	124	33,152
Miscellaneous	5	5,620	18	20,321
BEVERAGE				
Beverage	20	10,684	34	26,110
TOBACCO				
Tobacco	3	950	33	26,170
RUBBER				
Rubber	2	2,000	1	13,700
LEATHER				
Tanning	9	1,152	2	1,720
Shoe	69	12,978	47	37,298
Glove	1	300		
Trunks and saddles	23	3,656	60	17,196
TEXTILE				
Cotton	2	860	3	42,328
Wool			5	7,668
Cordage	2	272	2	3,170
Felt			3	2,445
Jute bags			4	2,180
Miscellaneous	5	788	9	4,300
Hosiery			2	2,060
Knitted			1	300
CLOTHING				
Men's	47	17,074	169	66,444
Women's			29	4,260
Fur	4	2,160	6	2,560

488

Corset	1	140	3	1,090
Hats	29	8,582	74	35,645
WOOD				
Saw mills	5	1,564	10	3,750
Sash and door	3	2,072	17	14,242
Boxes			8	7,186
Coopering	30	2,422	18	4,730
Household furniture	34	5,520	51	24,484
Office furniture			2	600
Miscellaneous furniture	6	636	22	11,030
Electric lamp			1	600
Cricket bats	1	100		
PAPER				
Roofing material	2	120	2	800
Boxes and bags			9	8,270
Wallpaper			2	4,300
PRINTING				
Commercial	19	4,890	73	30,512
Binding	4	270	8	1,640
Publishing			10	7,200
Publishing and printing			6	7,920
METAL				
Iron and steel	2	2,000	3	12,444
Iron foundries	12	7,110	23	20,762
Brass foundries	2	836	10	7,950
Metal rolling	2	700	2	5,050
Boilers			5	2,620
Structural metal			1	400
Ornamental metal	1	50	1	60
Metal stamping	9	1,142	10	6,946
Wire	5	2,100	11	10,810
Hardware and tools	1	600	8	8,112
Heating apparatus			1	1,400
Machine shops	2	124	26	5,880
Miscellaneous fabricating	6	2,124	21	9,120
Agricultural implements	4	2,400	5	2,400
Machinery	3	532	11	12,070
Scales	2	140	4	1,110

TRANSPORT EQUIPMENT

Railroad rolling stock	1	10,000	2	39,000
Ship yards	3	1,444	3	4,645
Carriagemaking	34	2,706	69	16,386

ELECTRICAL

Lighting fixtures			1	3,220
Telephones			1	400
Electric wire			1	250
Miscellaneous			3	2,404

NON-FERROUS

Bricks			6	2,920
Cement			1	750
Stone	17	1,952	4	2,270
Concrete			1	60
Glass			4	2,730
Lime	3	208	4	1,120
Miscellaneous	1	108		

PETROLEUM

Refining			1	888
----------	--	--	---	-----

CHEMICAL

Pharmaceuticals			3	4,000
Paint and varnish	3	260	10	9,620
Soap and candles	10	3,440	11	4,684
Industrial chemicals	4	228	2	2,600
Miscellaneous	4	510	8	1,840

JEWELLERY

Jewellery	16	1,670	33	16,080
-----------	----	-------	----	--------

MISCELLANEOUS

Scientific equipment			4	1,310
Sporting goods			3	1,240
Signs			1	200
Miscellaneous	15	2,520	40	9,778

BLACKSMITHING

Blacksmithing	63	2,818	93	6,923
Saw filing	1	24	4	110

TOTAL	631	148,482	1,352	757,309
-------	-----	---------	-------	---------

APPENDIX 3
MANUFACTURING FIRMS BY DISTRICTS AND SECTORS, MONTREAL 1861

	Food		Beverage		Leather		Clothing		Wood	
	No	Rent	No	Rent	No	Rent	No	Rent	No	Rent
Old Montreal	23	3,218	2	400	57	11,884	56	17,220	26	3,162
Outer Core	39	2,888	13	5,816	32	4,266	24	10,336	34	3,662
St-Antoine	21	1,704	5	3,984	24	3,514	24	10,366	21	2,480
St-Lawrence	13	932	6	1,700	4	228	0	0	10	1,014
St-Jacques	5	252	2	132	4	524	0	0	3	168
West End	12	14,910	0	0	7	1,620	1	400	16	5,302
Lachine	7	14,290	0	0	1	300	0	0	5	2,832
Griffintown	5	620	0	0	5	1,220	1	400	11	2,470
East End	10	530	5	4,468	6	316	0	0	3	188
Ste-Marie	10	530	5	4,468	6	316	0	0	3	188
TOTAL	84	21,546	20	10,684	102	18,086	81	27,956	79	12,314
	Printing		Metal		Transport Equipment		Non Metallic		Jewellery	
	No	Rent	No	Rent	No	Rent	No	Rent	No	Rent
Old Montreal	22	5,140	16	4,360	6	850	10	1,192	12	1,258
Outer Core	1	20	7	1,822	24	2,454	7	760	3	380
St-Antoine	0	0	6	1,722	14	1,880	2	260	3	380
St-Lawrence	1	20	1	100	6	440	5	500	0	0
St-Jacques	0	0	0	0	4	134	0	0	0	0
West End	0	0	26	13,380	6	10,768	1	108	1	32
Lachine	0	0	15	8,780	2	10,400	0	0	0	0
Griffintown	0	0	11	4,600	4	368	1	108	1	32
East End	0	0	2	296	2	78	3	208	0	0
Ste-Marie	0	0	2	296	2	78	3	208	0	0
TOTAL	23	5,160	51	19,858	38	14,150	21	2,268	16	1,670

MANUFACTURING FIRMS BY DISTRICTS AND SECTORS, MONTREAL 1890

	Food		Beverage		Tobacco		Leather	
	No	Rent	No	Rent	No	Rent	No	Rent
Old Montreal	29	13,045	5	2,800	16	6,750	23	15,550
Outer Core	73	22,500	22	15,380	9	4,140	59	34,160
St-Antoine	31	16,540	6	9,110	5	2,770	34	27,710
St-Lawrence	18	3,190	9	4,830	3	1,250	9	3,010
St-Jacques	24	2,770	7	1,440	1	120	16	3,440
West End	29	42,274	1	80	4	3,480	15	4,024
Lachine	9	22,320	1	80	0	0	4	380
Griffintown	7	6,180	0	0	4	3,480	1	1,000
St-Henri	12	13,714	0	0	0	0	10	2,644
East End	26	4,260	6	7,850	4	11,800	12	2,480
Ste-Marie	24	4,030	6	7,850	4	11,800	11	2,380
Maisonneuve	2	230	0	0	0	0	1	100
City	159	88,179	34	26,110	33	26,170	109	56,214

	Textile		Clothing		Wood		Printing	
	No	Rent	No	Rent	No	Rent	No	Rent
Old Montreal	7	2,300	89	45,990	27	15,650	64	34,650
Outer Core	5	3,060	160	60,070	59	29,400	29	12,130
St-Antoine	4	3,000	113	49,680	34	23,730	20	10,860
St-Lawrence	0	0	24	5,050	15	3,740	4	970
St-Jacques	1	60	21	4,640	10	1,930	5	300
West End	11	29,811	18	2,339	29	16,682	2	362
Lachine	4	8,590	5	310	7	6,810	0	0
Griffintown	3	530	0	0	14	5,180	0	0
St-Henri	4	20,691	13	2,029	8	4,692	2	362
East End	6	29,280	14	1,600	14	4,890	2	130
Ste-Marie	5	8,680	12	1,520	12	4,590	2	130
Maisonneuve	1	20,600	2	80	0	0	0	0
City	29	64,451	281	109,999	129	66,622	97	47,272

MANUFACTURING FIRMS BY DISTRICTS AND SECTORS, MONTREAL 1890

	Metal		Transport		Chemical		Total	
	No	Rent	No	Rent	No	Rent	No	Rent
Old Montreal	33	17,980	10	2,990	5	3,500	379	182,905
Outer Core	48	21,470	40	11,400	11	7,950	600	242,070
St-Antoine	34	17,020	20	7,870	7	6,490	355	190,640
St-Lawrence	10	3,950	9	2,070	3	1,260	123	32,350
St-Jacques	4	500	11	1,460	1	200	119	18,280
West	52	62,304	15	29,721	13	9,694	223	214,934
Lachine	15	19,300	4	24,650	6	5,510	68	92,740
Griffintown	20	15,440	5	380	3	1,650	67	41,360
St-Henri	16	26,864	6	4,691	4	2,534	88	80,834
East End	9	5,380	9	15,920	3	1,100	137	109,410
Ste-Marie	7	4,380	9	15,920	3	1,100	127	87,260
Maisonneuve	2	1,000	0	0	0	0	10	22,150
City Total	142	107,134	74	60,031	34	22,744	1,352	757,309

BIBLIOGRAPHY

Archives

City of Montreal Archives

Maisonneuve, Rôle d'évaluation et de Perception, 1892-1917.

Montreal, Rôle d'évaluation, 1847-1918.

Saint-Henri, Rôle d'évaluation, 1890-1905.

Sainte-Cunégonde, Rôle d'évaluation, 1890-1905.

Côte Saint-Paul, Rôle d'évaluation, 1895-1910

Imperial Tobacco Archives

Canadian Cigar and Tobacco Journal, 1898-1920

University of Toronto Rare Books

Canadian Shoe and Leather Journal, 1907-1914

Footwear in Canada, 1910-1918

Government Publications

Canada, Census of the Canadas, 1851-1852 (Quebec: Lovell, 1853).

Canada, "Report of the Commissioners of Public Works" found in
1) Journals of the Legislative Assembly of the Province of Canada, 1841-1859
2) Sessional Papers, 1860-1878/79.

Canada, Manuscript Census, Industrial Schedules, 1871.

Canada, "Report of the Select Committee on the manufacturing interests of the Dominion", Journals of the House of Commons, 1874 (Ottawa: I.B. Taylor, 1874).

- Canada, Census of Canada, 1870-1871 (Ottawa: Taylor, 1875).
- Canada, "The Annual Report of the Minister of Railways and Canals" in Sessional Papers, 1878/79-1900/01.
- Canada, "Report of the Select Committee on the causes of the recent depression of the manufacturing, mining, commercial, shipping, lumber and fishing interests", Journals of the House of Commons, (Ottawa: Maclean, Rogers and Co., 1876).
- Canada, Census of Canada, 1881 (Ottawa: MacLean, Roger and Co., 1883).
- Canada, Report of the Royal Commission on the Leasing of Water Power, Lachine Canal (Ottawa: McLean, Roger and Company, 1887).
- Canada, "Report of the Select Committee to investigate and report upon alleged combinations in manufactures, trade and insurance in Canada", Journals of the House of Commons, 1889 (Ottawa: Maclean, Rogers and Company, 1888).
- Canada, Report of the Royal Commission on the Relations of Capital and Labour in Canada - Quebec Evidence (Ottawa: Queen's Printer, 1889).
- Canada, Manuscript Census, Population Schedules, 1891.
- Canada, Census of Canada, 1891 (Ottawa: Dawson, 1894), vol. 3.
- Canada, Census of Canada, 1891 (Ottawa: Dawson, 1897), vol. 4.
- Canada, Census of Canada, 1901 (Ottawa: S.E. Dawson, 1905), vol. 3.
- Canada, Census of Canada, 1911 (Ottawa: Parmalee, 1913), vol. 3.
- Canada, Leather Boot and Shoe Industry (Ottawa: Minister of Trade and Commerce, 1923).
- Canada, Census of Canada, 1931 (Ottawa: J.O. Patenaude, 1933), vol. 2.
- Canada, Manufacturing Industries of the Province of Quebec, 1931 (Ottawa: Dominion Bureau of Statistics, 1933).
- Canada, Report of the Royal Commission on the Textile Industry (Ottawa: Patenaude, 1938).

Quebec, Statistical Yearbook of Quebec, 1920 (Quebec: L-A. Proulx, 1920).

Maps and Atlases

Goad, C.E., Insurance Plan of Manufacturing Premises Property of the Estate John Frothingham on Lachine Canal, Cote St. Paul (Montreal: C.E. Goad, 1880), Mill Survey No. 15.

Goad, C.E., Victor Hudon Cotton Mills, Hochelaga, Montreal (Montreal: C.E. Goad, 1882), Special Survey No. 30.

Goad, C.E., Atlas of the City of Montreal From Special Survey and Official Plans Showing All Buildings and Names of Owners (Montreal: C.E. Goad, 1890), 2 vols.

Goad, C.E., St. Lawrence Sugar Refinery, Montreal, Quebec (Montreal: C.E. Goad, 1900), No. 168. Revised edition of No. 145.

Goad, C.E., The Dominion Oil Cloth Co. Ltd., Montreal, Quebec, February 1906 (Montreal: C.E. Goad, 1906), No. 263.

Goad, C.E., Atlas of the City of Montreal and Vicinity From Official Plans - Special Surveys Showing Cadastral Numbers, Buildings and Lots (Montreal: C.E. Goad Inc., 1912-1914), 4 vols.

Goad, C.E., Fire Insurance Atlas, August 1915, vol. 3.

Hopkins, H.W., Atlas of the City and Island of Montreal Including the Counties of Jacques Cartier and Hochelaga (Montreal: Provincial Surveying and Publishing Company, 1879).

McKenzie, W.W., Map of the City of Montreal Shewing the Latest Improvements, 1852 (Montreal, 1852).

Plan of the Water Distribution of the City of St. Cunegonde (Montreal, November 1890).

Plan of the Water Distribution of the Town of St. Henry (Montreal, November 1890).

Ville de Montréal, Service de l'Urbanisme, Utilisation du Sol, 1:1,000.

Contemporary Journals, Books and Pamphlets

Atherton, W.H., Montreal, 1534-1914 (Montreal: Clarke, 1914).

Bell Telephone Company of Canada, Annual Report, 1885-1918.

Borthwick, J.D., Montreal, its History to Which is Added Biographical Sketches, with Photographs of Many of its Principal Citizens (Montreal: Drysdale and Company, 1875).

Bosworth, N., Hochelaga Depicta or the Early History and Present State of the City and Island of Montreal (Montreal: William Greig, 1839).

Bray, A.J., Canada Under the National Policy: Arts and Manufactures, 1883 (Montreal: The Industrial Publishing Company, 1883).

Burnett, J.A., "The cost of industrial power", The Journal of the Engineering Institute of Canada, 1923, 6, 3, pp. 140-141.

Canada Railway Advertising Company, Montreal Business Sketches With a Description of the City of Montreal, Its Public Buildings and Places of Interest (Montreal: M. Longmoore and Company, 1864).

Canada Year Book. 1922-1923 (Ottawa: Acland, 1924).

Canadian Engineer, 1893-1920

Canadian Journal of Commerce, 1875-1918

Canadian Reconstruction Association, The Boot and Shoe Industry (Toronto: np., 1920).

Casey, M.T.S., "The use of the power for port facilities", The Engineering Journal, 1924, 7, pp. 486-488.

Celebration Committee of the Grand Trunk Railway, Montreal in 1856 (Montreal: Lovell, 1856).

Chambers, E.J., Suburban Montreal as Seen From the Routes of the Park and Island Railway Co. (Montreal: Desbarats, 1895).

Chambers, E.J., The Book of Montreal: a Souvenir of Canada's Commercial Metropolis (Montreal: Book of Canada, 1903).

The Commerce of Montreal and its Manufactures (Montreal: Bishop Engraving, 1888).

Commercial Sketch of Montreal and its Superiority as a Wholesale Market (Montreal: Chisholm and Dodd, 1868).

Cowie, F.W., "The great national port of Canada. Features of the important extension work in progress in Montreal harbour", The Canadian Engineer, 1912, pp. 178-183.

Dominion Illustrated, 1889-1891.

Dominion Illustrated Christmas Number (Montreal: 1889).

Donald, W.J., "Zoning scheme builds up property values", Contract Record and Engineering Review, December 15, 1920.

Doucet, A.E., "History of the Montreal Aqueduct", The Journal of the Engineering Institute of Canada, 1921, 4, pp. 601-605.

Fastus, An Epoch in Printing, by Fastus: Being the First Matter Set on the First Linotype Machine Manufactured in Canada (Montreal: Linotype Company, 1892).

Frothingham and Workman, Price List 1872 (no publishing data).

Harpell, J.J., Canadian Industry, Commerce and Finance (Montreal: Industrial and Educational Press, 1916).

Houston, W.R., Annual Financial Review (Toronto: W. Briggs) 1901-1920.

Huttemeyer, K.G.C., Les intérêts commerciaux de Montréal et Québec et leurs manufactures - 1889 (Montréal: Imprimerie de la Gazette, 1889).

Industries of Canada: City of Montreal (Montreal: Gazette Printing, 1886).

Johnson, W.W., Sketches of the Late Depression; its Cause, Effect and Lessons With a Synoptical Review of Leading Trades During the Past Decade (Montreal: J.T. Robinson, 1882).

Kimball, F.M. "Small Electric Motors", Canadian Manufacturer, September 15, 1903.

Lovell, J., Montreal City Directory, 1860-1918.

- Lovell, J., Lovell's Historic Report of the Census of Montreal, 1891 (Montreal: Lovell, nd).
- Massicotte, E.Z., La cité de Sainte-Cunégonde de Montréal, notes et souvenirs (Montréal: J.S. Houle, 1893).
- Montreal Board of Trade, Board of Trade Illustrated Edition of Montreal (Montreal: Guertin Printing Company, 1909).
- Montreal: the Metropolis of Canada (Montreal: Gazette Printing Company, 1907).
- Patterson, W.J., Statements Relating to the Home and Foreign Trade of the Dominion of Canada: Also, Annual Report of the Committee of Montreal (Montreal: Gazette), 1868-1886.
- Procédés du Comité général de secours nommé par les citoyens de Montréal pour venir en aide aux victimes du grand incendie des 8 et 9 juillet 1852 (Montréal: John Lovell, 1853).
- Raphael, T.W., Annual Review of the Trade and Commerce of Montreal for 1866 (Montreal: Herald, 1867).
- Second rapport du comité exécutif du Comité de secours de Montréal présenté au Comité de secours le 18 octobre 1852 (Montréal: La Minerve, 1852).
- Small, H.B., The Products and Manufactures of the New Dominion (Ottawa: G.E. Desbarats, 1868).
- Souvenir Number of the Montreal Daily Star Reviewing the Various Financial and Commercial Interests Represented in the City of Montreal (Montreal: Henning and Camp, 1890).
- Special Number of the Dominion Illustrated Devoted to Montreal the Commercial Metropolis of Canada (Montreal: Sabiston Lithographic and Publishing Company, 1891).
- Watson, H.E., "Canada's Sixth Industry", The Canadian Magazine of Politics, Science, Art and Literature, 1911, pp. 33-40.

Books, Theses and Articles

- Abbott, C., Boosters and Businessmen: Popular Economic Thought and Urban Growth in Antebellum Middle West (Westport: Greenwood Press, 1981).
- Abramovitz, M., "The nature and significance of Kuznets cycles", Economic Development and Change, 1961, 19, pp. 225-248.
- Agnew, J.A., "The devaluation of place in social science" in J.A. Agnew and J.S. Duncan (eds.), The Power of Place: Bringing Together Geographical and Sociological Imaginations (Boston: Unwin Hyman, 1989), pp. 9-29.
- Ames, H.B., The City Below the Hill (Toronto: University of Toronto Press, 1972).
- Anderson, L., "Water Supply" in N.R. Ball (ed.), Building Canada: a History of Public Works (Toronto: University of Toronto Press, 1988), pp. 195-220.
- Armstrong, C. and H.V. Nelles, "Suburban street railway strategies in Montreal, Toronto and Vancouver, 1896-1930" in G.A. Stelter and A.F.J. Artibise (eds.), Power and Place. Canadian Urban Development in the North American Context (Vancouver: University of British Columbia Press, 1986), pp. 187-218.
- Artibise, A.F.J., "Boosterism and the development of Prairie cities, 1871-1931" in G.A. Stelter and A.F.J. Artibise (eds.), Shaping the Canadian Landscape: Aspects of the Canadian City-Building Process (Ottawa: Carleton University Press, 1982), pp. 116-147.
- Ashton, P.J., "The political economy of suburban development" in W.K. Tabb and L. Sawers (eds.), Marxism and the Metropolis (New York: Oxford University Press, 1978), pp. 64-89.
- Atack, J., "Firm size and industrial structure in the United States during the nineteenth century", Journal of Economic History, 1986, 44, pp. 463-475.
- Atelier d'Histoire Hochelga-Maisonneuve, De fil en aiguille: Chronique ouvrière d'une filature de coton à Hochelaga en 1880 (Montréal: np., 1985).
- Austin, B., "Managing marketing in a commodities manufacturing firm: Dominion Textile", Business and Economic History, 2nd Series, 18, 1989, pp. 168-177.
- Baker, A.R.H., "On ideology and historical geography" in A.R.H. Baker and M. Billinge (eds.), Period and Place: Research Methods in Historical Geography (Cambridge: Cambridge University Press, 1982), pp. 233-243.

- Baker, A.R.H and M. Billinge (eds.), Period and Place: Research Methods in Historical Geography (Cambridge: Cambridge University Press, 1982).
- Ball, M., "Housing analysis: time for a theoretical refocus?", Housing Studies, 1986, 1, pp. 147-165.
- Ball, M., "Housing provision and comparative research" in M. Ball, M. Harloe and M. Martens, Housing and Social Change in Europe and the USA (London: Routledge, 1988), pp. 7-40.
- Ball, M., "The built environment and the urban question", Environment and Planning D, 1986, 4, pp. 447-464.
- Barnes, T.J., "Place, space and theories of economic value: contextualism and essentialism in economic geography", Transactions. Institute of British Geographers, N.S., 1989, 14, pp. 299-316.
- Barrett, J.R., Work and Community in the Jungle: Chicago's Packinghouse Workers, 1894-1922 (Urbana and Chicago: University of Illinois Press, 1987).
- Bater, J.H., "Industrialization in nineteenth-century St. Petersburg: the role of linkages in shaping locational patterns" in L. Collins and D.F. Walker (eds.), Locational Dynamics of Manufacturing Activity (London: Wiley and Son, 1975), pp. 255-278.
- Beeby, D., "Industrial strategy and manufacturing growth in Toronto, 1880-1910", Ontario History, 1984, 76, pp. 199-232.
- Bellavance, M. and J-D. Gronoff, "Les structures de l'espace Montréalais à l'époque de la Confédération", Cahiers de géographie du Québec, 1980, 24, pp. 363-384.
- Benoit, J., "Joseph Barsalou" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1990), vol. 12, pp. 62-64.
- Berman, M., All That is Solid Melts into Air (New York: Penguin, 1988).
- Billinge, M., "Reconstructing societies in the past: the collective biography of local communities" in A.R.H. Baker and M. Billinge (eds.), Period and Place: Research Methods in Historical Geography (Cambridge: Cambridge University Press, 1982), pp. 233-243.
- Binns, R.M., Montreal's Electric Streetcars. An Illustrated History of the Tramway Era: 1892 to 1959 (Montreal: Railfare, 1973).

- Bischoff, P., "La formation des traditions de solidarité ouvrière chez mouleurs montréalais: la longue marche vers le syndicalisme (1859-1881)", Labour/Le Travail, 1988, 21, pp. 9-43.
- Bischoff, P., "Des forges du Saint-Maurice aux fonderies de Montréal: mobilité géographique, solidarité communautaire et action syndicale les mouleurs, 1829-1881", Revue d'histoire de l'Amérique française, 1989, 43, pp. 3-29.
- Bischoff, P. and R. Tremblay, "James Robertson" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1990), vol. 12, pp. 900-901.
- Blackburn, P., R. Coombs and K. Green, Technology, Economic Growth and the Labour Process (London: Macmillan, 1985).
- Blanchard, R., L'Ouest du Canada français: Montréal et sa région (Montréal: Beauchemin, 1953).
- Bluestone, B. and B. Harrison, The Deindustrialization of America (New York: Basic Books, 1982).
- Boddy, M.J., "Structural approaches to industrial location" in W.F. Lever (ed.), Industrial Change in the United Kingdom (London: Longman, 1987), pp. 56-66.
- Bodnar, J.F., Immigration and Industrialization: Ethnicity in an American Milltown, 1870-1940 (Pittsburgh: University of Pittsburgh Press, 1977).
- Boissevain, J., The Italians of Montreal (Ottawa: Information Canada, 1970).
- Borchert, J., "American metropolitan evolution", Geographical Review, 1967, 62, pp. 301-332.
- Bowden, M.J., "Growth of the central districts in large cities" in L.F. Schnore (ed.), The New Urban History: Quantitative Explorations by American Historians (Princeton: Princeton University Press, 1975), pp. 75-109.
- Bradbury, B., "The family economy and work in an industrializing city: Montreal in the 1870s", Canadian Historical Association, Historical Papers, 1979, pp. 71-96.
- Bradbury, J., "Regional and industrial restructuring processes in the new international division of labour", Progress in Human Geography, 1985, 9, pp. 38-63.

- Bradbury, J., "Technical change and the restructuring of the North American steel industry" in K. Chapman and G. Humphry (eds.), Technical Change and Industrial Policy (Oxford: Basil Blackwell, 1987), pp. 157-173.
- Braverman, H., Labor and Monopoly Capital: the Degradation of Work in the Twentieth Century (New York: Monthly Review Press, 1974).
- Brouillard, P., "La Commission du Havre de Montréal (1850-1896)" in Société historique de Montréal, Montréal: artisans, histoire, patrimoine (Montréal: Fides, 1979), pp. 83-102.
- Bruce, C., News and the Southams (Toronto: Macmillan, 1968).
- Buder, S., Pullman: an Experiment in Industrial Order and Community Planning, 1880-1930 (New York: Oxford University Press, 1967).
- Burawoy, M., Manufacturing Consent: Changes in the Labour Process Under Monopoly Capitalism (Chicago: University of Chicago Press, 1979).
- Burawoy, M., The Politics of Production (London: Verso, 1985).
- Burgess, J., "L'industrie de la chaussure à Montréal: 1840-1870 -- le passage de l'artisanat à la fabrique", Revue d'histoire de l'Amérique française, 1977, 31, pp. 187-210.
- Burgess, J., "Work, family and community: Montreal's leather craftsmen, 1790-1831" (Ph.D. thesis, Université du Québec à Montréal, 1986), 2 vols.
- Burgess, J., "Exploring the limited identities of Canadian labour: recent trends in English-Canada and in Quebec", International Journal of Canadian Studies, 1990, 1-2, pp. 149-173.
- Burns, A.F., Production Trends in the United States Since 1870 (New York: National Bureau of Economic Research, 1934).
- Butlin, R.A., "Theory and methodology in historical geography" in M. Pacione (ed.), Historical Geography: Progress and Prospect (London: Croom Helm, 1987), pp. 16-45.
- Caya, M., "Sévère Rivard" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1982), vol. 11, pp. 755-756.
- Chandler, A.D., The Visible Hand: the Managerial Revolution in American Business (Cambridge: Belknap Press, 1977).

- Chandler, A.D., "Technology and the transformation of industrial organization" in J. Colton and S. Bruchey (eds.), Technology, the Economy, and Society (New York: Columbia University Press, 1987), pp. 56-82.
- Chandler, A.D., Scale and Scope: the Dynamics of Industrial Capitalism (Cambridge: Belknap Press, 1990).
- Chinitz, B., "Contrasts in agglomerations: New York and Pittsburgh", American Economic Review, 1961, 51, pp. 279-289.
- Choko, M., Crises du logement à Montréal (1860-1939) (Montréal: Albert Saint-Martin, 1980).
- Chorley, T.A.B., "Nutrition, technology and the growth of the British biscuit industry, 1820-1900" in D. Oddy and D. Miller (eds.), The Making of the British Diet (London: Croom Helm, 1976), pp. 13-25.
- Clark, J., C. Freeman and L. Soete, "Long waves, inventions and innovations" in C. Freeman (ed.), Long Waves in the World Economy (London: Frances Pinter, 1984), pp. 63-77.
- Clark, V.S., The History of Manufactures in the United States (New York: Peter Smith, 1949), 3 vols.
- Clawson, D., Bureaucracy and the Labor Process (New York: Monthly Review Press, 1980).
- Coase, R.H., "The nature of the firm", Economica, 1937, 4, pp. 386-405.
- Cochrane, A., "What a difference place makes: the new structuralism of locality", Antipode, 1987, 19, pp. 354-363.
- Cohen, R.B., "The new international division of labour, multinational corporations and urban hierarchy" in M. Dear and A.J. Scott (eds.), Urbanization and Urban Planning in Capitalist Society (London: Methuen, 1981), pp. 287-315.
- Collard, E., "Owen McGarvey" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1990), vol. 12, pp. 624-625.
- Collin, J-P., "La Cité sur mesure: spécialisation sociale de l'espace et autonomie municipale dans la banlieue montréalaise, 1875-1920", Urban History Review, 1984, 13, pp. 19-34.

- Communaute Urbaine de Montréal, Architecture industrielle (Montréal: Communaute Urbaine de Montréal, 1982).
- Conter, A.H., "The origins of a working-class district: a portrait of Saint-Ann's ward in the 1850s" (Undergraduate paper, McGill University, 1976).
- Cooke, P. (ed.), Localities: the Changing Face of Urban Britain (London: Unwin Hyman, 1989).
- Coombs, R., "Labour and monopoly capital", New Left Review, 1978, 107, pp. 79-96.
- Cooper, J.I., Montreal, a Brief History (Montreal: McGill-Queen's University Press, 1969).
- Copp, T., The Anatomy of Poverty. The Condition of the Working-Class in Montreal. 1897-1929 (Toronto: McClelland and Stewart, 1974).
- Couvares, F.G., The Remaking of Pittsburgh: Class and Culture in an Industrializing City. 1877-1919 (Albany: State University of New York Press, 1984).
- Cox, K.R., "The politics of turf and the question of class" in J. Wolch and M. Dear (eds.), The Power of Geography (Boston: Unwin Hyman, 1989), pp. 61-90.
- Cox, K.R. and A. Mair, "Locality and community in the politics of local economic development", Annals of the Association of American Geographers, 1988, 78, pp. 307-325.
- Cox, K.R. and A. Mair, "Levels of abstraction in locality studies", Antipode, 1989, 21, pp. 121-132.
- Cox, K.R. and A. Mair, "Urban growth machines and the politics of local economic development", International Journal of Urban and Regional Research, 1989, 13, pp. 137-146.
- Craven, P. and T. Traves, "Canadian railways as manufacturers, 1850-1880", Canadian Historical Association, Historical Papers, 1983, pp. 254-281.
- Cross, D.S., "The neglected majority: the changing role of women in nineteenth-century Montreal" in G.A. Stelter and A.F.J. Artibise (eds.), The Canadian City (Toronto: McClelland and Stewart, 1977), pp. 255-281.
- Cumbler, J., Working Class Community in Industrial America: Work Leisure and Struggle in Two Industrial Cities, 1880-1930 (Westport, Conn.: Greenwood Press, 1979).

- Dales, J.H., Hydroelectricity and Industrial Development: Quebec, 1898-1940 (Cambridge: Harvard University Press, 1957).
- Dawley, A., Class and Community: the Industrial Revolution in Lynn (Cambridge: Harvard University Press, 1976).
- De Bonville, J., Jean-Baptiste Gagnepetit. Les travailleurs montréalais à la fin du XIXe siècle (Montréal: l'Aurore, 1975).
- De Bonville, J., La presse Québécoise de 1884 à 1914. Genèse d'un média de masse (Québec: Les Presses de l'Université Laval, 1988).
- Denison, M., The Barley and the Stream: the Molson Story (Toronto: McClelland and Stewart, 1955).
- Dennis, R., "People and housing in industrial society" in M. Pacione (ed.), Historical Geography: Progress and Prospect (London: Croom Helm, 1987), pp. 184-216.
- Dennis, R., "History, geography and historical geography", Social Science History, 1991, 15, pp. 265-288.
- Dennis, R. and H. Prince, "Research in British urban historical geography" in D. Denecke and G. Shaw (eds.), Urban Historical Geography: Recent Progress in Britain and Germany (Cambridge: Cambridge University Press, 1988).
- Dickinson, J.A. and B. Young, "Periodization in Quebec history: a reevaluation", Québec Studies, 1991, 12, pp. 1-10.
- Domosh, M., "The symbolism of the skyscraper: case studies of New York's first tall buildings", Journal of Urban History, 1988, 14, pp. 321-345.
- Domosh, M., "Shaping the commercial city: retail districts in nineteenth-century New York and Boston", Annals of the Association of American Geographers, 1990, 80, pp. 268-284.
- Donald, W.J.A., The Canadian Iron and Steel Industry (Boston: Houghton Mifflin, 1915).
- DuBoff, R., "The introduction of electric power in American manufacturing", Economic History Review, 1967, 20, pp. 509-518.
- Duggan, E.P., "Machines, market and labor: the carriage and wagon industry in late-nineteenth-century Cincinnati", Business History Review, 1977, 51, 3, pp. 308-325.

- Duncan, S. and M. Savage, "Space, scale and locality", Antipode, 1989, 21, pp. 179-206.
- Dutton, H.I. and S.R.H. Jones, "Invention and innovation in the British pin industry, 1790-1850", Business History Review, 1983, 57, pp. 175-193.
- Dyer, D. and D.B. Sicilia, "From commodity to speciality chemicals: cellulose products and naval stores at the Hercule Powder Company, 1919-1939", Business and Economic History, 2nd Series, 1989, 18, pp. 59-71.
- Easterlin, R.A., Population, Labor Force and Long Swings in Economic Growth, the American Experience (New York: National Bureau of Economic Research, Columbia University, 1968).
- Edwards, R., Contested Terrain: the Transformation of the Workplace in the Twentieth Century (New York: Basic Books, 1979).
- Elbaum, B. and F. Wilkinson, "Industrial relations and uneven development: a comparative study of the American and British steel industries", Cambridge Journal of Economics, 1979, 3, pp. 275-303.
- Erickson, E.P. and W.L. Yancey, "Work and residence in industrial Philadelphia", Journal of Urban History, 1979, 5, pp. 147-182.
- Fales, R.L. and L.N. Moses, "Land use theory and the spatial structure of the nineteenth-century city", Papers of the Regional Science Association, 1972, 28, pp. 49-80.
- Feagin, J.R., "Urban real estate speculation in the United States: implications for social science and urban planning", International Journal of Urban and Regional Research, 1982, 6, pp. 35-60.
- Featherling, D., The Rise of the Canadian Newspaper (Toronto: Oxford University Press, 1990).
- Feltoe, R., Redpath: the History of a Sugar House (Toronto: Natural Heritage/Natural History Inc., 1991).
- Ferland, J., "Evolution des rapports sociaux dans l'industrie canadienne du cuir au tournant du 20e siècle (Ph.D. thesis, McGill University, 1985).
- Ferland, J., "Syndicalisme 'parcellaire' et syndicalisme 'collectif': une interprétation socio-technique des conflits ouvriers dans deux industries québécoises, 1880-1914", Labour/Le Travail, 1987, 19, pp. 49-88.

- Ferland, J., "Not for sale" - American technology and Canadian shoe factories: the United Shoe Machinery Company of Canada, 1899-1912", American Review of Canadian Studies, 1988, 18, pp. 59-82.
- Ferland, J., "In search of the unbound Prometheia': a comparative view of women's activism in two Quebec industries, 1869-1908", Labour/Le Travail, 1989, 24, pp. 11-44.
- Fountain, J., "The growth of the local enterprise: from J.M. Schneider Ltd to the Heritage Group" in D.F. Walker (ed.), Manufacturing in Kitchener-Waterloo: a Long Term Perspective (Waterloo: Department of Geography Publication Series No. 26, University of Waterloo), pp. 83-105.
- Fraser, S. "Combined and uneven development in the men's clothing industry", Business History Review, 1983, 57, pp. 522-547.
- Freeman, C. (ed.), Long Waves in the World Economy (London: Frances Pinter, 1984).
- Freeman, C. (ed.), Design, Innovation, and Long Cycles in Economic Development (New York: St Martin's Press, 1986).
- Freeman, C., J. Clark and L. Soete, Unemployment and Technical Innovation (London: Frances Pinter, 1982).
- Friedman, A., Industry and Labour: Class Struggle at Work and Monopoly Capitalism (London: Macmillan, 1977).
- Gad, G. and D. Holdsworth, "Corporate capitalism and the emergence of the high-rise office building", Urban Geography, 1987, 8, pp. 212-231.
- Gauthier, J-P. and P. Larivière, "La cité de Maisonneuve. Ville modèle du début du siècle" in Société historique de Montréal, Montréal: artisans, histoire, patrimoine (Montréal: Fides, 1979), pp. 103-119.
- Gertler, M., "The limits to flexibility: comments on the Post-Fordist vision of production and its geography", Transactions. Institute of British Geographers, N.S., 1988, 13, pp. 419-432.
- Glasmeyer, A., "Factors governing the development of high tech industry agglomerations: a tale of three cities", Regional Studies, 1988, 22, pp. 287-301.
- Goldfield, D.R. and B.A. Brownell, Urban America: From Downtown to Notown (Boston: Houghton Mifflin, 1979).

- Goliger, G., "Le Cours St-Pierre", Habitat, 1982, 25, pp. 35-40.
- Gordon, D.M., "Capitalist development and the history of American cities" in W.K. Tabb and L. Sawers (eds.), Marxism and the Metropolis (New York: Oxford University Press, 1978), pp. 25-63.
- Gordon, D.M., R. Edwards and M. Reich, Segmented Work, Divided Workers (New York: Cambridge University Press, 1982).
- Gottediener, M., The Social Production of Urban Space (Austin: University of Texas Press, 1985).
- Graham, J., "Theory and essentialism in Marxist geography", Antipode, 1990, 22, 1, pp. 53-66.
- Greenberg, S., "Industrial location and ethnic residential patterns in an industrializing city: Philadelphia, 1880" in T. Hershberg (ed.), Philadelphia: Work, Space, Family and Group Experience (New York: Oxford University Press, 1981), pp. 204-229.
- Gregory, D., Regional Transformation and Industrial Revolution: a Geography of the Yorkshire Woollen Industry (London: Macmillan, 1982).
- Gregory, D., "Suspended animation: the stasis of diffusion theory" in D. Gregory and J. Urry (eds.), Social Relations and Spatial Structures (London: Macmillan, 1985), pp. 296-336.
- Gregson, N., "The CURS initiative: some further comments", Antipode, 1987, 19, pp. 364-370.
- Gunton, T.I., "The ideas and policies of the Canadian planning profession, 1909-1931" in A.F.J. Artibise and G. Stelter (eds.), The Usable Urban Past: Planning and Politics in the Modern Canadian City (Toronto: Macmillan, 1979), pp. 177-195.
- Hagey, M.J. and Malecki, E.J., "Linkages in high technology industries: a Florida case study", Environment and Planning A, 1986, 18, pp. 1477-1498.
- Haila, A., "Four types of investment in land and property", International Journal of Urban and Regional Research, 1991, 15, pp. 343-365.
- Hall, P., "The location of the clothing trades in London, 1861-1951", Transactions. Institute of British Geographers, 1960, 28, pp. 155-178.

- Hall, P., The Industries of London (London: Hutchinson, 1962).
- Hall, P., "The geography of the fifth Kondratieff" in P. Hall and A. Markusen (eds.), Silicon Landscapes (Boston: Allen and Unwin, 1985), pp. 1-19.
- Hamelin, J., P. Larocque et J. Rouillard, Répertoire des grèves dans la province de Québec au XIXe siècle (Montréal: Les Presses de l'École des Hautes Etudes Commerciales, 1970).
- Hamelin, J. and J-P. Montminy, "Québec 1896-1929: une deuxième phase d'industrialisation" in F. Dumont, J. Hamelin, F. Harvey et J-P Montminy (eds.), Idéologues au Canada français 1900-1929 (Québec: Les Presses de l'Université Laval, 1973), pp. 15-28.
- Hamelin, J. and Y. Roby, Histoire économique du Québec, 1851-1896 (Montréal: Fides, 1971).
- Hanna, D.B., "The new town of Montreal: creation of an upper middle class suburb on the slope of Mount Royal in the mid-nineteenth century" (M.A. thesis, University of Toronto, 1977).
- Hanna, D.B., "Montreal, a city built by small builders, 1867-1880" (Ph.D. thesis, McGill University, 1986).
- Hanna, D.B., "Partage social et partage de l'espace a Montréal, 1847-1901", Rapport d'Étape, presented to the Fonds F.C.A.R., 30 Juin, 1986.
- Hanna, D.B. and F.W. Remiggi, Montreal Neighbourhoods (Canadian Association of Geographers, May 1980).
- Hanson, N., "The emergence and development of zoning controls in North American municipalities: a critical analysis" (Papers on Planning and Design, No. 14, Department of Urban and Regional Planning, University of Toronto, 1977).
- Harris, R., "A working-class suburb for immigrants, Toronto 1090-1913", Geographical Review, 1991, 81, pp. 318-332.
- Harris, R., "Pioneering the jungle suburbs: owner-building in North American cities, 1900-1950", manuscript, McMaster University, Hamilton, Ontario.
- Harrison, B., "Regional restructuring and "good business climates": the economic transformation of New England since World War II" in L. Sawers and W.K. Tabb (eds.), Sunbelt and Snowbelt: Urban Development and Regional Restructuring (New York: Oxford University Press, 1984), pp. 48-96.

- Harvey, D., "The urban process under capitalism: a framework for analysis" in M. Dear and A.J. Scott (eds.), Urbanization and Urban Planning in Capitalist Society (London: Methuen, 1981), pp. 91-121.
- Harvey, D., The Limits to Capital (Chicago: The University of Chicago Press, 1982).
- Heron, C., "The crisis of the craftsman: Hamilton's metal workers in the early twentieth century", Labour/Le Travailleur, 1980, 6, pp. 7-48.
- Heron, C., Working in Steel: the Early Years in Canada, 1883-1935 (Toronto: McClelland and Stewart, 1988).
- Hiebert, D., "Discontinuity and the emergence of flexible production: garment production in Toronto, 1901-1931", Economic Geography, 1990, 3, pp. 229-253.
- Hill, R., "Capital accumulation and urbanization in the United States", Comparative Urban Research, 1975, 4, pp. 39-60.
- Hoare, A.G., "Industrial linkage studies" in M. Pacione (ed.), Progress in Industrial Geography (London: Croon. Helm, 1985), pp. 40-81.
- Hogue, A., A. Bolduc and D. Larouche, Québec. Un siècle d'électricité (Montréal: Libre Expression, 1979).
- Holmes, J., "Industrial reorganization, capital restructuring and locational change: an analysis of the Canadian automobile industry in the 1960s", Economic Geography, 1983, 59, pp. 251-171.
- Hoover, E.M., Location Theory and the Shoe and Leather Industries (Cambridge: Harvard University Press, 1937).
- Hoover, E.M. and R. Vernon, Anatomy of a Metropolis (New York: Anchor, 1959).
- Hounshell, D.A., From the American System to Mass Production, 1800-1932: the Development of the Manufacturing Technology in the United States (Baltimore: The John Hopkins Press, 1984).
- Hudson, R., "Capital accumulation and regional problems: a study of North East England, 1945 to 1980" in F.E.I. Hamilton and G.J.R. Linge (eds.), Regional Economic and Industrial Systems (Chichester: Wiley, 1983), pp. 75-101.
- Isard, W., "Transport development and building cycles", Quarterly Journal of Economics, 1942, 57, pp. 90-112.

- Isard, W., "A neglected cycle: the transport-building cycles", The Review of Economic Statistics, 1942, 24, pp. 149-158.
- Jackson, K.T., Crabgrass Frontier: The Suburbanization of the United States (New York: Oxford University Press, 1985).
- Jonas, A., "A new regional geography of localities", Area, 1988, 20, pp. 101-110.
- Kealey, G., Toronto Workers Respond to Industrial Capitalism, 1867-1892 (Toronto: University of Toronto Press, 1980).
- Kealey, G., "Work control, the labour process, and nineteenth-century Canadian printers" in C. Heron and R. Storey (eds.), On the Job: Confronting the Labour Process in Canada (Kingston and Montreal: McGill and Queen's University Press, 1986), pp. 75-101.
- Kellett, J.R., The Impact of Railways on Victorian Cities (London: Routledge and Kegan Paul, 1969).
- Kilbourn, W., The Elements Combined: a History of the Steel Company of Canada (Toronto: Clarke, Irwin, 1960).
- Kobayashi, A. and S. Mackenzie (eds.), Remaking Human Geography (Boston: Hyman Unwin, 1989).
- Konvitz, J.W., M.H. Rose and J.A. Tarr, "Technology and the city", Technology and Culture, 1990, 31, pp. 284-294.
- Kuznets, S., Secular Movements in Production and Prices (Boston: Houghton Mifflin, 1930).
- Lamontagne, M., Business Cycles in Canada (Ottawa: Canadian Institute for Economic Policy, 1984).
- Lamoreaux, N.R., The Great Merger Movement in American Business, 1895-1904 (New York: Cambridge University Press, 1985).
- Lancaster Regionalism Group, Localities, Class and Gender (London: Pion, 1985).
- Larivière, C., Petite Bourgogne (Montréal: Editions Québécoise, 1973).
- La Société historique de Saint-Henri, Portrait d'une ville: Saint-Henri 1875-1905 (Montréal: La Société historique de Saint-Henri, 1987).

- Laurie, B., Artisans into Workers: Labor in Nineteenth-Century America (New York: Noonday Press, 1990).
- Laurie, B. and M. Schmitz, "Manufacture and productivity: the making of an industrial base, Philadelphia, 1850-1880" in T. Hershberg (ed.), Philadelphia: Work, Space, Family and Group Experience in the Nineteenth Century (New York: Oxford University Press, 1981), pp. 43-92.
- Lauzon, G., Habitat ouvrier et révolution industrielle: le cas du village St-Augustin (Montréal: Collection RCHTQ, 1989).
- Lauzon, G. and L. Ruellard, 1875/Saint-Henri (Montréal: Société historique de Saint-Henri, 1985).
- Lefebvre, H., The Production of Space (Oxford: Basil Blackwell, 1990).
- Leitner, H. and E. Sheppard, "The city as a locus of production" in R. Peet and N. Thrift (eds.), New Models in Geography (London: Unwin Hyman, 1989), vol. 2, pp. 55-83.
- Levine, A., "William Watson Ogilvie" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1990), vol. 12, pp. 800-801.
- Levine, G.J., "Criticizing the assessment: views of the property evaluation process in Montreal, 1870-1920, and their implications for historical geography", Canadian Geographer, 1984, 28, pp. 276-284.
- Levine, G.J., "Class, ethnicity and property transfers in Montreal, 1907-1909", Journal of Historical Geography, 1988, 14, pp. 360-380.
- Lewis, R.D., "The development of an early suburban industrial district: the Montreal ward of Saint-Ann, 1851-1871", Urban History Review, 1991, 19, pp. 166-180.
- Lewis, R.D., "The segregated city: class residential patterns and the development of industrial districts in Montreal, 1861 and 1901", Journal of Urban History, 1991, 17, pp. 123-152.
- Licht, W., Working for the Railroad: the Organization of Work in the Nineteenth century (Princeton: Princeton University Press, 1983).
- Lighthall, W.D., "City government" in A. Shortt and A.G. Doughty (eds.), Canada and Its Provinces (Toronto: Glasgow, Brooke and Company, 1914), vol. 15, pp. 299-320.

- Linteau, P-A., "Le développement du port de Montréal au début du 20e siècle", Canadian Historical Association, Historical Papers, 1972, pp. 181-205.
- Linteau, P-A., "Jean-Baptiste Rolland" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1982), vol. 11, pp. 765-766.
- Linteau, P-A., "Charles-Séraphin Rodier" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1982), vol. 11, p. 763.
- Linteau, P-A., The Promoters' City: Building the Industrial Town of Maisonneuve, 1883-1918 (Toronto: Lorimer, 1985).
- Linteau, P-A., "Canadian suburbanization in a North American context: does the border make a difference", Journal of Urban History, 1987, 13, pp. 252-274.
- Linteau, P-A., R. Durocher et J-C. Robert, Quebec: a History, 1867-1929 (Toronto: Lorimer, 1985).
- Littler, C.R., The Development of the Labour Process in Capitalist Societies (London: Heinemann, 1982).
- Logan, J.R. and H.L. Molotch, Urban Fortunes: the Political Economy of Place (Berkeley: University of California Press, 1987).
- Lovering, J., "Fordism's unknown successor: a comment on Scott's theory of flexible accumulation and the re-emergence of regional economies", International Journal of Urban and Regional Research, 1990, 14, pp. 159-174.
- Maddison, A., Phases of Capitalist Development (Oxford: Oxford University Press, 1982).
- Mandel, E., Marxist Economic Theory (London: Merlin Press, 1962).
- Mandel, E., Late Capitalism (London: New Left Books, 1975).
- Mandel, E., Long Waves and the World Economy (Cambridge: Cambridge University Press, 1980).
- Manson, D.M., M.M. Howland and G.E. Peterson, "The effect of business cycles on metropolitan suburbanization", Economic Geography, 1984, 60, pp. 71-80.
- Marcuse, P., "Gentrification, homelessness, and the work process: housing markets and labour markets in the quartered city", Housing Studies, 1989, 4, pp. 211-220.

- Marglin, S., "What do bosses do? The origins and functions of hierarchy in capitalist production", Review of Radical Political Economy, 1974, 6, pp. 60-112.
- Marsan, J-C., Montreal in Evolution (Montreal: McGill-Queen's University Press, 1981).
- Marshall, A., Principles of Economics (London: Macmillan, 1961), 9th edition.
- Marshall, R.S., "The development of "La Côte à Baron"" (Paper written for the School of Urban Planning, McGill University, 1983).
- Martel, E., "L'industrie à Montréal en 1871" (M.A. thesis, Université du Québec à Montréal, 1976).
- Martin, M., "Communication and social forms: the development of the telephone, 1876-1920", Antipode, 1991, 23, pp. 307-333.
- Martin, R., "The reorganisation of regional theory: alternative perspectives on the changing capitalist space economy", Geoforum, 1989, 20, pp. 187-201.
- Marx, K., Capital (New York: Vintage Books, 1977), vol. 1.
- Massey, D., "A critical evaluation of industrial location theory" in F.E.I. Hamilton and G.J.R. Linge (eds.), Spatial Analysis, Industry and the Industrial Environment: Progress in Research and Applications (Chicester: Wiley, 1979), vol. 1, pp. 57-72.
- Massey, D., Spatial Divisions of Labour: Social Structures and the Geography of Production (London: Macmillan, 1984).
- Massey, D. and R. Meegan, The Anatomy of Job Loss: the How, Where and Why of Unemployment Decline (London: Methuen, 1982).
- McCallum, J., Unequal Beginnings: Agriculture and Economic Development in Quebec and Ontario Until 1870 (Toronto: University of Toronto Press, 1980).
- McKay, I., "Capital and labour in the Halifax baking and confectionery industry during the last half of the nineteenth century", Labour/Le Travailleur, 1978, 3, pp. 63-108.
- McKay, J.P., Tramways and Trolleys: the Rise of Urban Mass Transit in Europe (Princeton: Princeton University Press, 1976).

- McLaughlin, G.E., Growth of American Manufacturing Areas: a Comparative Analysis with Special Emphasis on Trends in the Pittsburgh District (Pittsburgh: Bureau of Business Research, University of Pittsburgh, 1938).
- McNally, L., Water Power on the Lachine Canal, 1846-1900 (Ottawa: Parks Canada, 1982).
- Mensch, G., Stalemate in Technology (Cambridge: Ballinger, 1979).
- Meyer, D.R., "Emergence of the American manufacturing belt: an interpretation", Journal of Historical Geography, 1983, 9, pp. 145-174.
- Meyer, S., "Technology and the workplace: skilled and production workers at Allis-Chalmers, 1900-1941", Technology and Culture, 1988, 29, pp. 839-864.
- Milot, M., "John McDougall" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1990), vol. 12, pp. 620-621.
- Monet, J., "Alexandre-Maurice Delisle" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1972), vol. 10, p. 220.
- Montgomery, D., "Whose standards? Workers and the reorganization of production in the United States, 1900-1920" in D. Montgomery, Workers' Control in America (Cambridge: Cambridge University Press, 1979), pp. 113-138.
- Montgomery, D., The Fall of the House of Labour (Cambridge: Cambridge University Press, 1987).
- Moses, L.N., "Location and the theory of production", The Quarterly Journal of Economics, 1958, 72, pp. 259-272.
- Moses, L. and H. Williamson, "The location of economic activity in cities", American Economic Review, 1967, 57, pp. 211-222.
- Muller, E.K., "From waterfront to metropolitan region: the geographical development of American cities" in H. Gillette, jr. and Z.L. Miller (eds.), American Urbanism: a Historiographic Review (Westport: Greenwood Press, 1987), pp. 105-133.
- Muller, E.K. and P.A. Groves, "The changing location of the clothing industry: a link to the social geography of Baltimore in the nineteenth century", Maryland Historical Magazine, 1976, 71, 3, pp. 403-420.

- Muller, E.K. and P.A. Groves, "The emergence of industrial districts in mid-nineteenth century Baltimore", Geographical Review, 1979, 69, pp. 159-178.
- Muller, P.O., Contemporary Suburban America (Englewood Cliffs: Prentice-Hall, 1981).
- Murgatroyd, L. and J. Urry, "The class and gender restructuring of the Lancaster economy, 1950-1980" in Lancaster Regionalism Group, Localities, Class and Gender, (London: Pion, 1985), pp. 30-53.
- Naheut, R., "Une expérience canadienne de taylorisme: le cas des usines Angus du Canadien Pacifique" (Maitrise, L'Université du Québec à Montréal, 1984).
- Naylor, T., The History of Canadian Business, 1867-1914 (Toronto: Lorimer, 1975), 2 vols.
- Nelson, D., Managers and Workers: Origins of the New Factory System in the United States (Madison: University of Wisconsin Press, 1975).
- Nelson, D., American Rubber Workers and Organized Labor, 1900-1941 (Princeton: Princeton University Press, 1988).
- Nuwer, M., "From batch to flow: production technology and work-force skills in the steel industry, 1880-1920", Technology and Culture, 1988, 29, pp. 808-838.
- O'Brien, A.P., "Factory size, economies of scale, and the great merger wave of 1898-1902", Journal of Economic History, 1988, 48, pp. 639-649.
- Olson, S., "Baltimore imitates the spider", Annals of the Association of American Geographers, 1979, 69, pp. 557-574.
- Olson, S., "Partage social et partage de l'espace a Montréal, 1847-1901", Rapport d'Étape presented to the Fonds F.C.A.R., 31 Janvier, 1986.
- Olson, S., "Ethnic strategies in the urban economy", Canadian Ethnic Studies, 1991, 33, pp. 39-64.
- Othick, J., "The cocoa and chocolate industry in the nineteenth century" in D. Oddy and D. Miller (eds.), The Making of the British Diet (London: Croom Helm, 1976), pp. 77-90.
- Ouellet, C., "Rapport de recherche sur les implantations industrielles et commerciales dans la ville de Saint-Henri 1876-1905" (Unpublished paper, Université du Québec à Montréal, 1980).

- Ouellet, C., "Les industries du cuir à Montréal 1871-1891" (Unpublished paper, Université du Québec à Montréal, 1981).
- Ouellet, C., "Les élites municipales et la municipalisation de Saint-Henri et Sainte-Cunégonde, 1875-1878" (Unpublished paper, Université du Québec à Montréal, 1982).
- Parker, G.L., "John Lovell" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1990), vol. 12, pp. 569-574.
- Palmer, B.D., A Culture in Conflict: Skilled Workers and Industrial Capitalism in Hamilton, Ontario, 1860-1914 (Kingston and Montreal: McGill-Queens University Press, 1979).
- Palmer, B.D., Working-Class Experience. The Rise and Reconstitution of Canadian Labour, 1800-1980 (Toronto: Butterworth, 1983).
- Passfield, R., "Waterways" in N.R. Ball (ed.), Building Canada: a History of Public Works (Toronto: University of Toronto Press, 1988), pp. 113-142.
- Payette-Daoust, M., "The Montreal garment industry, 1871-1901" (M.A. thesis, McGill University, 1986).
- Pentland, H.C., "The role of capital in Canadian economic development before 1875", Canadian Journal of Economic and Political Science, 1950, 16, pp. 457-474.
- Pentland, H.C., "The development of a capitalistic labour market in Canada", Canadian Journal of Economic and Political Science, 1959, 25, pp. 450-461.
- Perrons, D., "The role of Ireland in the new international division of labour: a proposed framework for regional analysis", Regional Studies, 1981, 15, pp. 81-100.
- Perry, D. and A. Watkins, The Rise of the Sunbelt Cities (Beverly Hills: Sage, 1977).
- Phelps, N.A., "External economies, agglomeration and flexible accumulation", Transactions. Institute of British Geographers, N.S., 1992, 17, pp. 35-46.
- Pinard, G., Montréal: son histoire, son architecture (Montréal: La Presse, 1987).
- Piore, M. and C.F. Sabel, The Second Industrial Divide: Possibilities for Prosperity (New York: Basic Books, 1984).

- Pooley, C., "Residential differentiation in Victorian cities: a reassessment", Transactions. Institute of British Geographers, N.S., 1984, 9, pp. 131-144.
- Pooley, C., "The historical geography of industrial change" in M. Pacione (ed.), Historical Geography: Progress and Prospect (London: Croom Helm, 1987), pp. 158-183.
- Poutenen, M.A., "For the benefit of the master: the Montreal needle trades during the transition, 1820-1842" (M.A. thesis, McGill University, 1985).
- Pratt, E.E., Industrial Causes of Congestion of Population in New York City (New York: Columbia University Press, 1911).
- Pred, A.R., "The intrametropolitan location of American manufacturing", Annals of the Association of American Geographers, 1964, 54, pp. 165-180.
- Pred, A.R., "Manufacturing in the American mercantile city: 1800-1840", Annals of the Association of American Geographers, 1966, 56, pp. 307-338.
- Pred, A.R., The Spatial Dynamics of U.S. Urban-Industrial Growth, 1800-1914 (Cambridge: MIT Press, 1966).
- Price, R., "Theories of labour process formation", Journal of Social History, 1984, pp. 91-110.
- Ramirez, B., "Montreal's Italians and the socioeconomy of settlement: some historical hypotheses", Urban History Review, 1981, 10, pp. 39-48.
- Ramirez, B., "Brief encounters: Italian immigrant workers and the CPR, 1900-1930", Labour/Le Travail, 1986, 17, pp. 9-28.
- Ramirez, B., On the Move: French-Canadian and Italian Migrants in the North Atlantic Economy, 1860-1914 (Toronto: McClelland and Stewart, 1991).
- Ramirez, B. and M. Del Balso, "The Italians of Montreal: from sojourning to settlement, 1900-1920" in R.F. Harney and J.V. Scarpaci (eds.), Little Italies in North America (Toronto: Multicultural History Society of Ontario, 1981).
- Resnick, S.A. and R.D. Wolff, Knowledge and Class: a Marxian Critique of Political Economy (Chicago: University of Chicago Press, 1987).
- Robert, J.-C., "Ferdinand David" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1982), vol. 11, pp. 235-236.

- Roberts, L., From Three Men (np: Dominion Rubber Company Ltd., nd).
- Roberts, W., "The last artisans: Toronto printers, 1896-1914" in G.S. Kealey and P. Warrian (eds.), Essays in Canadian Working Class History (Toronto: McClelland and Stewart, 1976), pp. 125-142.
- Roberts, W., "Toronto metal workers and the second industrial revolution, 1889-1914", Labour/Le Travailleur, 1980, 6, pp. 49-72.
- Rogers, N., "Industrial decline, restructuring and relocation: Aston and the Great Victorian Depression" in J. Anderson, S. Duncan and R. Hudson (eds.), Redundant Spaces in Cities and Regions (London: Academic Press, 1983), pp. 99-126.
- Rose, D., "Accumulation versus reproduction in the inner city: The Recurrent Crisis of London revisited" in M. Dear and A.J. Scott (eds.), Urbanization and Urban Planning in Capitalist Society (London: Methuen, 1981), pp. 339-381.
- Rose, D., "Home-ownership, uneven development and industrial change in late nineteenth-century Britain" (D.Phil. thesis, University of Sussex, 1984).
- Rosen, C.M., The Limits of Power: Great Fires and the Process of City Growth in America (New York: Cambridge University Press, 1986).
- Rosenberg, N., Perspectives on Technology (Cambridge: Cambridge University Press, 1976).
- Rosenberg, N., Inside the Black Box: Technology and Economics (Cambridge: Cambridge University Press, 1982).
- Rothwell, R., "The role of small firms in the emergence of new technologies" in C. Freeman (ed.), Design, Innovation and Long Waves (New York: St Martin's Press, 1986), pp. 231-248.
- Rothwell, R. and W. Zegueld, Reindustrialization and Technology (London: Longman, 1985).
- Rouillard, J., "Les travailleurs juifs de la confection à Montréal (1910-1980)", Labour/Le Travailleur, 1981/1982, 8/9, pp. 253-259.
- Rudin, R., "Victor Hudon" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1990), vol. 12, pp. 455-457.

- Rutherford, P., A Victorian Authority: the Daily Press in Late Nineteenth-Century Canada (Toronto: University of Toronto Press, 1982).
- Sabel, C. and J. Zeitlin, "Historical alternatives to mass production: politics, markets and technology in nineteenth-century industrialization", Past and Present, 1985, 108, pp. 133-176.
- Samuel, R., "Workshop of the world: steam power and hand technology in mid-Victorian Britain", History Workshop, 1977, 3, pp. 6-72.
- Saxenian, A., "The urban contradictions of Silicon Valley: regional growth and the restructuring of the semiconductor industry" in L. Sawers and W.K. Tabb (eds.), Sunbelt and Snowbelt: Urban Development and Regional Restructuring (New York: Oxford University Press, 1984), pp. 163-197.
- Sayer, R.A., "Explanation in economic geography: abstraction versus generalization", Progress in Human Geography, 1982, 6, pp. 68-88.
- Sayer, R.A., Method in Social Science: a Realist Approach (London: Hutchinson, 1984).
- Sayer, R.A., "Industry and space: a sympathetic critique of radical research", Environment and Planning D, 1985, 3, pp. 3-29.
- Sayer, R.A., "Dualistic thinking and rhetoric in geography", Area, 1989, 21, pp. 301-305.
- Sayer, R.A. and K. Morgan, "A modern industry in a declining region: links between method, theory and policy" in D. Massey and R. Meegan (eds.), Politics and Method (London: Methuen, 1985), pp. 147-168.
- Schreuder, Y., "Labor segmentation, ethnic division of labor, and residential segregation in American cities in the early twentieth century", Professional Geographer, 1989, 41, pp. 131-143.
- Scott, A.J., "The spatial structure of metropolitan labor markets and the theory of intra-urban plant location", Urban Geography, 1982, 2, pp. 1-30.
- Scott, A.J., "Locational patterns and dynamics of industrial activity in the modern metropolis", Urban Studies, 1982, 19, pp. 111-142.
- Scott, A.J., "Production system dynamics and metropolitan development", Annals of the Association of American Geographers, 1982, 72, pp. 185-200.

- Scott, A.J., "Industrial organization and the logic of intra-metropolitan location: I. theoretical considerations", Economic Geography, 1983, 59, pp. 233-250.
- Scott, A.J., "Industrial organization and the logic of intra-metropolitan location, III: a case study of the women's dress industry in the Greater Los Angeles region", Economic Geography, 1984, 60, pp. 3-27.
- Scott, A.J., "Locational processes, urbanization and territorial development: an exploratory essay", Environment and Planning A, 1985, 17, pp. 479-501.
- Scott, A.J., "Industrial organization and location: division of labor, the firm and spatial process", Economic Geography, 1986, 62, pp. 215-231.
- Scott, A.J., "Industrialization and urbanization: a geographical agenda", Annals of the Association of American Geographers, 1986, 76, pp. 25-37.
- Scott, A.J., "Flexible production systems and regional development: the rise of new industrial spaces in North America and Western Europe", International Journal of Urban and Regional Research, 1988, 12, pp. 171-186.
- Scott, A.J., New Industrial Spaces (London: Pion, 1988).
- Scott, A.J., Metropolis: From the Division of Labor to Urban Form (Berkeley and Los Angeles: University of California Press, 1988).
- Scott, F.R. and H.M. Cassidy, Labour Conditions in the Men's Clothing Industry (Toronto: Thomas Nelson and Sons Ltd., 1935).
- Scranton, P., Proprietary Capitalism: the Textile Manufacture at Philadelphia, 1800-1885 (New York: Cambridge University Press, 1983).
- Scranton, P., "An exceedingly irregular business: structure and process in the Paterson silk industry, 1885-1910" in P. Scranton (ed.), Silk City: Studies on the Paterson Silk Industry, 1860-1940 (Newark: New Jersey Historical Society, 1985), pp. 35-72.
- Scranton, P., "Beyond anecdotes and aggregates: the pattern of industrial decline in Philadelphia textiles, 1916-1931", Antipode, 1986, 18, pp. 284-310.
- Scranton, P., "The workplace, technology, and theory in American labor history", International Labor and Working-Class History, 1989, 35, pp. 3-22.
- Scranton, P., "Many cities, many hills: production, space, and diversity in Pennsylvania's urban history", Pennsylvania History, 1992, 59, pp. 29-37.

- Seidel, J., "The development and social adjustment of the Jewish community in Montreal" (M.A. thesis, McGill University, 1939).
- Smith, D., "Neoclassical location theory" in W.F. Lever (ed.), Industrial Change in the United Kingdom (London: Longman, 1987), pp. 23-37.
- Smith, M.P. and J.R. Feagin, The Capitalist City: Global Restructuring and Community Politics (Oxford: Basil Blackwell, 1987).
- Smith, N., Uneven Development. Nature, Capital and the Production of Space (Oxford: Basil Blackwell, 1984).
- Smith, N., "Dangers of the empirical turn: some comments on the CURS initiative", Antipode, 1987, 19, pp. 59-68.
- Smith, N., "Uneven development and location theory: toward a synthesis" in R. Peet and N. Thrift (eds.), New Models in Geography: the Political-Economy Perspective (London: Unwin Hyman, 1989), vol. 1, pp. 142-163.
- Smucker, J., Industrialization in Canada (Scarborough: Prentice-Hall, 1980).
- Soja, E.W., "Regions in context: spatiality, periodicity, and the historical geography of the regional question", Environment and Planning D, 1985, 3, pp. 175-190.
- Soja, E.W., Postmodern Geographies. The Reassertion of Space in Critical Social Theory (London: Verso, 1989).
- Soja, E., R. Morales and G. Wolff, "Urban restructuring: an analysis of social and spatial change in Los Angeles", Economic Geography, 1983, 59, pp. 195-230.
- Soltow, J.H., "Origins of small business and the relationship between large and small firms: metal fabricating and machinery making in New England, 1890-1957" in S.W. Bruchey (ed.), Small Business in American Life (New York: Columbia University Press, 1980), pp. 192-211.
- Soucy-Roy, C., "Le quartier Ste-Marie" (Maitrise es Arts: Université Québec à Montréal, 1977).
- Sparks, R.P., "The garment and clothing industries", Manual of the Textile Industry of Canada, 1930 (Montreal: Canadian Textile Journal Publishing Co., nd.), pp. 107-130.
- Steed, G.P.F., "Location factors and dynamics of Montreal's large garment complex", Tijdschrift voor Economische en Sociale Geografie, 1976, 67, pp. 151-168.

- Steed, G.P.F., "Standardization, scale, incubation, and inertia: Montreal and Toronto clothing industries", Canadian Geographer, 1976, 20, pp. 298-309.
- Sternlieb, G. and J.W. Hughes (eds.), Post-Industrial America: Metropolitan Decline and Inter-Regional Job Shifts (New Brunswick: Center for Policy Research, 1975).
- Stevens, G.R., Ogilvie in Canada, Pioneer Miller, 1801-1951 (Toronto: Ashton Potter, 1951).
- Stewart, A.M., "Settling an 18th-century faubourg: property and family in the Saint-Laurent suburb, 1735-1810" (M.A. thesis, McGill University, 1988).
- Stone, K., "The origins of job structures in the steel industry" in R. Edwards, M. Reich and D. Gordon (eds.), Labor Market Segmentation (Lexington, Mass: D.C. Heath, 1977), pp. 27-84.
- Storper, M., "Technology and the new regional growth complexes: the economics of discontinuous spatial development" in P. Nijkamp (ed.), Technological Change, Employment and Spatial Dynamics (Berlin: Springer-Verlag, 1985), pp. 46-75.
- Storper, M., "Technology and spatial production relations: disequilibrium, interindustry relationships, and industrial development" in M. Castells (ed.), High Technology, Space and Society (Beverly Hills: Sage, 1985), pp. 265-283.
- Storper, M., "The post-Enlightenment challenge to Marxist urban studies", Environment and Planning D, 1987, 5, pp. 418-426.
- Storper, M., "Big structures, small events, and large processes in economic geography", Environment and Planning A, 1988, 20, pp. 165-185.
- Storper, M. and A.J. Scott, "The geographical foundations and social regulation of flexible production complexes" in J. Wolch and M. Dear (eds.), The Power of Geography: How Territory Shapes Social Life (Winchester, Mass.: Unwin Hyman, 1989), pp. 21-40.
- Storper, M. and R. Walker, The Capitalist Imperative: Territory, Technology and Industrial Growth (New York: Basil Blackwell, 1989).
- Struyk, R., "External economies and the distribution of industrial growth within the metropolis", Review of Regional Studies, 1972, 3, pp. 23-34.
- Struyk, R. and F. James, Intrametropolitan Industrial Location (Lexington, Mass.: D.C. Heath, 1975).

- Sutcliffe, A., The Autumn of Central Paris. The Defeat of Town Planning, 1850-1970 (Montreal: McGill-Queen's University Press, 1971).
- Sweeny, R., "Internal dynamics and the international cycle: questions of the transition in Montreal, 1821-1828" (Ph.D. thesis, McGill University, 1985).
- Taylor, G.D., "Charles F. Sise, Bell Canada, and the Americans: a study of managerial autonomy", Canadian Historical Association, Historical Papers, 1982, pp. 11-30.
- Taylor, G.D. and P.A. Sudnik, DuPont and the International Chemical Industry (Boston: Twayne, 1984).
- Taylor, G.R., Satellite Cities: a Study of Industrial Suburbs (New York: D. Appleton and Co., 1915).
- Teal, G.L., "The organization of production and the heterogeneity of the working class: occupation, gender and ethnicity among clothing workers in Quebec" (Ph.D. thesis, McGill University, 1986).
- Thornton, P., S. Olson and Q. Thuy Thach, "Dimensions sociales de la mortalité infantile à Montréal, au milieu du XIXe siècle", Annales de démographie historique 1988 (Paris: Société de démographie historique), pp. 299-325
- Thrift, "Review of Metropolis: From the Division of Labor to Urban Form", Progress in Human Geography, 1989, 13, pp. 607-609.
- Traves, T., The State and Enterprise: Canadian Manufacturers and the Federal Government, 1917-1931 (Toronto: University of Toronto Press, 1979).
- Tulchinsky, G., "William Workman" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1972), vol. 10, pp. 717-718.
- Tulchinsky, G., "John Frothingham" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1976), vol. 9, pp. 288-289.
- Tulchinsky, G., "Fredrick Warren Harris" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1976), vol. 9, pp. 367.
- Tulchinsky, G., "John Redpath" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1976), vol. 9, pp. 654-655.

- Tulchinsky, G., The River Barons: Montreal Businessmen and the Growth of Industry and Transportation, 1837-1853 (Toronto: University of Toronto Press, 1977).
- Tulchinsky, G., "Augustin Cantin" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1990), vol. 12, pp. 158-159.
- Tulchinsky, G., "Samuel Davis" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1990), vol. 12, pp. 228-229.
- Tulchinsky, G. and B. Young, "John Young" in Dictionary of Canadian Biography (Toronto: University of Toronto Press, 1972), vol. 10, pp. 722-728.
- Urry, J., "Localities, regions and social class", International Journal of Urban and Regional Research, 1981, 5, pp. 455-474.
- Urry, J., "Locality research: the case of Lancaster", Regional Studies, 1986, 20, pp. 233-242.
- Urry, J., "Society, space and locality", Environment and Planning D, 1987, 5, pp. 435-444.
- van Duijn, J.J., The Long Wave in Economic Life (London: Allen and Unwin, 1983).
- van Duijn, J.J., "Fluctuations in innovations over time" in C. Freeman (ed.), Long Waves and the World Economy (London: Francis Pinter, 1984), pp. 19-30.
- van Nus, W., "Towards the city efficient: the theory and practice of zoning, 1919-1939" in A.F.J. Artibise and G. Stelter (eds.), The Usable Urban Past: Planning and Politics in the Modern Canadian City (Toronto: Macmillan, 1979), pp. 226-246.
- van Nus, W., "The role of the suburban government in the city-building process: the case of Notre-Dame-de-Grace, Quebec, 1867-1910", Urban History Review, 1984, 13, pp. 91-103.
- Vance, J., "Housing the worker: the employment linkage as a force in urban structure", Economic Geography, 1966, 62, pp. 294-325.
- Viehe, F.W., "Black gold suburbs: the influence of the extractive industry on the suburbanization of Los Angeles, 1890-1930", Journal of Urban History, 1981, 8, pp. 3-26.

- Walker, R., "The transformation of urban structure in the nineteenth century and the beginnings of suburbanization" in K. Cox (ed.), Urbanization and Conflict in Market Societies (Chicago: Maaroufa Press, 1979), pp. 165-212.
- Walker, R., "A theory of suburbanization: capitalism and the construction of urban space in the United States" in M. Dear and A.J. Scott (eds.), Urbanization and Urban Planning in Capitalist Society (New York: Methuen, 1981), pp. 383-429.
- Walker, R., "Technological determination and determinism: industrial growth and location" in M. Castells (ed.), High Technology, Space and Society (Beverly Hills: Sage, 1985), pp. 226-264.
- Walker, R., "The geographical organization of production systems", Environment and Planning D, 1988, 6, pp. 377-408.
- Ward, D., "The industrial revolution and the emergence of Boston's central business district", Economic Geography, 1966, 42, pp. 152-171.
- Ward, D., Cities and Immigrants (New York: Oxford University Press, 1971).
- Warde, A., "Recipes for pudding: a comment on locality", Antipode, 1989, 21, pp. 274-281.
- Warf, B., "The resurrection of local uniqueness" in R.G. Golledge, H. Couclelis and P. Gould (eds.), A Search For Common Ground (Goleta: Santa Barbara Geographical Press, 1988), pp. 51-62.
- Warner, S.B., The Private City: Philadelphia in Three Periods of its Growth (Philadelphia: University of Pennsylvania Press, 1968).
- Warner, S.B., Streetcar Suburbs: the Process of Growth in Boston, 1870-1900 (Cambridge: Harvard University Press, 1978).
- Weber, A., Theory of the Location of Industries (Chicago: University of Chicago Press, 1929).
- Weiss, M.A., The Rise of Community Builders. The American Real Estate Industry and Urban Land Planning (New York: Columbia University Press, 1987).
- Weisskopf, T., "The current economic crisis in historical perspective", Socialist Review, 1981, 11, pp. 9-53.

- Wilkins, M., The Emergence of Multinational Enterprise: American Business Abroad from the Colonial Era to 1914 (Cambridge: Harvard University Press, 1970).
- Williams, K., T. Cutler, J. Williams and C. Haslam, "The end of mass production?", Economy and Society, 1987, 16, pp. 405-439.
- Willis, J., The Process of Hydraulic Industrialization on the Lachine Canal: Origins, Rise and Fall (Ottawa: Environment Canada, 1987).
- Winkler, J.K., Tobacco Tycoon: the Story of James Buchanan Duke (New York: Random House, 1942).
- Wood, S., The Degradation of Work? (London: Hutchinson, 1982).
- Wood, W.A., The Days of John Wood. Watchmaker (Hudson: Wood Family Archives, 1986).
- Woodbury, C., "Industrial location and urban redevelopment" in C. Woodbury (ed.), The Future of Cities and Urban Redevelopment (Chicago: University of Chicago Press, 1953), pp. 105-288.
- Yeates, M. and B. Garner, The North American City (San Francisco: Harper and Row, 1980).
- Young, B., In Its Corporate Capacity: the Seminary of Montreal as a Business Institution, 1816-1876 (Kingston and Montreal: McGill-Queen's University Press, 1986).
- Young, B. and J. Dickinson, A Short History of Quebec: a Socio-Economic Perspective (Toronto: Copp, Clarke Pitman, 1988).
- Young, C.H., The Ukrainian Canadians (Toronto: Thomas Nelson and Sons, 1931).
- Zunz, O., The Changing Face of Inequality (Chicago: The University of Chicago Press, 1982).