

Mapping the Changes: The spatial development of Industrial Montreal, 1861–1929

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Résumé de l'article

Une étude du patrimoine industriel de Montréal a été complétée en 1991 par une équipe de recherche à l'université Concordia. Cette recherche avait comme but la préparation d'un inventaire de toutes les entreprises industrielles à Montréal depuis 1825, jusqu'à 1950. Un aspect important de la recherche est la possibilité de reproduire, par la cartographie automatique, des cartes de la répartition géographique des entreprises manufacturières; ce qui contribue à la meilleure compréhension de l'évolution industrielle de Montréal du XIX^e et au début du XX^e siècles. Des cartes de l'ensemble des industries et d'un secteur (les aliments et boissons) sont présentées pour démontrer quelques éléments du processus d'industrialisation de la ville la plus importante au Canada.

Mapping the Changes: The spatial development of Industrial Montreal, 1861–1929*

Brian Slack, Lourdes Meana, Martha Langford, and Patricia Thornton

Abstract:

In 1991, a research team centred at Concordia University undertook a contract for the city of Montreal. The task was to prepare an inventory of all industrial establishments that had been in existence in the city between the 1820s and 1950. One of the most important contributions of the project was to make its inventory of industrial firms available for spatial display. Computer generated maps of a large set of industrial categories are available to assist research into the industrialisation process in Canada's largest and most diverse manufacturing city of the nineteenth and early twentieth centuries. This paper employs the data and the maps of one industrial group (food and beverage), and all industries to describe some of the important spatial processes occurring in Montreal's industrialisation.

Résumé:

Une étude du patrimoine industriel de Montréal a été complétée en 1991 par une équipe de recherche à l'université Concordia. Cette recherche avait comme but la préparation d'un inventaire de tous les entreprises industrielles à Montréal depuis 1825, jusqu'à 1950. Un aspect important de la recherche est la possibilité de reproduire, par la cartographie automatique, des cartes de la répartition géographique des entreprises manufacturières; ce qui contribue à la meilleure compréhension de l'évolution industrielle de Montréal du XIX^e et au début du XX^e siècles. Des cartes de l'ensemble des industries et d'un secteur (les aliments et boissons) sont présentées pour démontrer quelques éléments du processus d'industrialisation de la ville la plus importante au Canada.

Manufacturing industry was the primary motor of the economic growth of Montreal from the 1840s until 1929.

Industrialisation transformed the city. It precipitated a rapid expansion of population that saw Montreal grow from 22,500 in 1825, through 90,323 in 1861, to nearly 250,000 in 1891, and over 1 million by 1929. This, in turn, transformed the socio-economic character of the city, in which a class of industrial labourers comprised the large majority. In addition, the ethnic composition of the city was to change several times, as waves of different peoples swelled the manufacturing labour force. As elsewhere, industrialisation altered the urban tissue. A new type of building, the factory, made its appearance in the urban landscape. New industrial suburbs were created, and old neighbourhoods were transformed. The city as a whole began to expand.

In certain respects, Montreal was not unique in its industrialisation. Many other urban centres in Canada were experiencing similar transformations during this time period. What distinguishes Montreal from the others is the scale of industrialisation. Montreal emerged as the largest centre of manufacturing in Canada (see Table 1). Although there was a degree of specialisation in its manufacturing base, the range of industries represented in the period under review is exceptional. Montreal's industrialisation, therefore, had a significance not just for the city itself, but for Canada as a whole, and for Quebec in particular.

In 1990, the ministère des Affaires culturelles du Québec entered into a bi-lateral agreement with the ville de Montréal to establish a programme whose goal is the preservation of the city's rich industrial heritage. The first stage of the programme called for the preparation of an inventory of industrial establishments, the production of an atlas, and a determination of the processes that shaped the city's industrialisa-

tion. These tasks were carried out by a research team at Concordia University.

This paper begins by reviewing the methodologies employed by the research team in carrying out its mandate. Several practical problems led to the modification of some of the original goals, but we were successful in producing an inventory of industrial establishments by type, size, and location for a number of representative years. The information collected is much more than a list of industrial premises, however. Computer-drawn maps can be produced rapidly at any scale for an industry sub-group as easily as for all manufacturing. These data comprise a rich research resource.¹

The principal objective of this paper is to demonstrate some of the research potential of the maps, and of the inventory upon which they are based. We provide a general overview of the industrialisation process in Montreal, and by focusing on one of Montreal's leading industrial sectors, the food and beverage industry, examine how it was transformed between the 1840s and 1929. From this survey several features of Montreal's industrialisation are highlighted: the emergence of urban industrial districts, the shift away from an artisanal mode of production, and the diverse character of manufacturing as a whole.

Research Methodology

The original mandate issued by the City and the Province had comprised four elements. It called for the preparation of a bibliography of studies relating to the history of industry in Montreal; it sought an elaboration of the historical context of manufacturing and the types of industries in Montreal; it requested an inventory of manufacturing establishments in Montreal between the 1820s and 1950; and it called for the preparation of an historical atlas of industry in the city of Montreal.

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Table 1: Montreal's Share of Industrial Production of Canada and Quebec

		% OF EMPLOYEES	% VALUE OF PRODUCTION
1871	CANADA	11,4	14,8
	QUEBEC	31,7	42,4
1891	CANADA	13,7	17,7
	QUEBEC	36,2	52,3
1929	CANADA	17,5	17,9
	QUEBEC	57,2	62,6
1946	CANADA	18,8	17,1
	QUEBEC	55,7	54,9

SOURCE: Census of Canada, and Dominion Bureau of Statistics

It was with the third element of the mandate, the inventory, that the greatest problems were encountered. The clients had originally requested a complete listing of manufacturing premises for the entire period. They were quickly convinced that such an undertaking would be difficult (and expensive), if not impossible. It was agreed that an inventory of manufacturing premises would be undertaken for five separate years. Since the contract called for a survey between the 1820s and 1950, the first and last years were more or less fixed. In fact we decided on 1825, the year of the Viger census, and 1946, as the first complete Post-War year. We then needed to select three years that best represented the intervening changes in manufacturing.

It is well recognised that the process of urban industrial growth in the nineteenth and twentieth centuries was not even. A number of longitudinal studies of individual industries and of urban growth in general have demonstrated the cyclical nature of industrialisation.² Industrial capitalism produced periods of rapid expansion as a result of new combinations of technology and industrial organization. These periods were followed by recessions,

brought about by overcapacity and competition. Several general stage models of manufacturing growth have been put forward to describe the process,³ and recently attempts have been made to explain the uneven trajectory of industrialisation in terms of Kondratieff waves.⁴ A three-stage model is usually postulated, beginning with a pre-industrial period, when urban industry is artisanal and small scale. This is followed by a period of transition, when the first evidence of large scale industrialisation is manifested. Finally, comes the phase of metropolitanisation, marked by the concentration of capital and the appearance of corporate capitalism. The periods ascribed to this process differ according to the authors and locales, but there is general recognition that the 1840s marks the break between the first and second stage, and the decade of the 1880s divides the second from the third. For Montreal, Linteau, Durocher and Robert⁵ provide evidence for strong industrial growth in three periods: 1840-1860, the 1880s, and 1896-1914, although others have demonstrated the industrialisation of certain sectors prior to the 1840s.⁶

We finally selected 1861, 1890 and 1929 as representative years. The choice was made because each of these years was near the end of a growth period. In this way we hoped to capture the state of Montreal's industrialisation prior to a phase of retrenchment or recession. Although 1914 would have been closer to the end of the pre-war growth period, we wished to capture the important developments in the organisation of some industries and the emergence of others that occurred in the immediate post-war years. Thus, the choice of 1929 provided an opportunity to incorporate these developments, prior to the Great Depression.

Because the relevant data for the census of 1881 and 1891 are not available (the manufacturing manuscripts were destroyed), the inventories of industrial establishments are based on the municipal water tax assessment rolls that have been recorded annually in Montreal since 1847, and whose research value had already been identified by Hanna and Olson.⁷ The rolls provide the name of the owner and the occupant, the street address, an indication of the type of manufacturing, and (significantly) a measure of its size, based on its evaluation. Additional checks were made by consulting several business directories.⁸

We adopted a consistent set of criteria to determine whether or not a business would be included in the inventory. All firms engaged in construction, including roofers and carpenters, were excluded. Similarly, butchers were not included, unless it was apparent that manufacturing was taking place on the business premises. All businesses included in the inventory were classified according to the Standard Industrial Classification system of 1951, since it was easier to retro-classify firms based on a modern system, than to attempt a classification of more recent businesses based on a nineteenth century taxonomy.

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Table 2: The Industrial Sectors of Montreal

Food and beverage industry bakers and confectioners brewing and beverage	flour milling others
Tobacco Industry tobacco manufacturers	
Chemical Industry rubber products pharmaceutical products soap	petroleum refineries paints others
Leather Industry tanneries others	boot makers shoes
Textile Industry Cotton spinning and weaving	others
Clothing Industry mens clothing furs	womens clothing others
Wood Industry saw mills others	furniture
Paper Industry pulp and paper	others
Printing and publishing commercial printers publishers	newspapers
Metal Industries iron foundries copper foundries metal products	steel aluminium foundries others
Transport equipment airplanes rail equipment	shipyards others
Electrical products	
Non-metallic minerals glass	others
Other industries jewellery	others

Although it did not appear in the original terms of reference, we considered the ease of information retrieval as an essential element in our mandate. We wished to be able to display the locational data as efficiently as possible in order to facilitate the production of the required Atlas. We decided to use AutoCAD, for the production of computer-drawn maps. One advantage of this system is that it permits maps to be displayed or printed at any scale.

The first step was the construction of base maps. For the three years covered here, we used the *Waterlow*⁹ map for 1860, the *Goad Atlas*¹⁰ for 1890, and the *Lovell street map*¹¹ for 1929. Each base map shows the actual shore of the St. Lawrence River of that period, Mount Royal, and the principal railroad tracks. A grid of main streets facilitates the location of the firms.

The location of the firms on the base maps was determined by their street addresses. Each firm was symbolized on the maps by a dot. Several businesses, especially in the clothing industry, shared premises in the same building. In this case, dots were placed in the vicinity of the street address to avoid stacking the dots on top of each other. This inevitably resulted in some slight locational distortion, but the number of firms in each period is accurately portrayed.

Every business was classified by SIC codes and by assessed value. Fourteen major groups of industries were recognised (see Table 2), each (with the exception of electrical products) being further subdivided into several sub-groupings. The mapping files were organised so that a map containing any combination of sub-groupings can be generated as easily as a distribution map of a single SIC subgroup. In addition, the relative size of the businesses, based on the assessed values, can be displayed for each location. We adopted a stan-

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dard procedure to achieve this, involving a three-part classification of firms. The smallest ones, identified by the smallest dots, are the premises whose assessments lie below the median value of all industries in that particular year. The mid-size dots refer to those establishments whose assessments lie between the median and the 85th centile. The largest dots signify firms whose assessed values exceed the 85th centile. The degree to which dots can be visually differentiated on the basis of size is limited by the scale at which the maps are plotted and by the hardware devices used for plotting or printing.

The maps that now can be produced so easily provide a unique opportunity to follow the industrial development of Montreal. Although there have been a number of detailed sectoral studies¹² and historical analyses of certain industrial neighbourhoods,¹³ for the first time it is possible to examine the totality of manufacturing in Montreal. The maps may help resolve some of the unanswered questions concerning the city's industrialisation, while the distributions of particular industry groupings will almost certainly raise new research questions.

The General Evolution of Industry, 1860–1929

Because of the complexity and scale of Montreal's industrialisation, it is impossible in a short paper such as this to cover all the facets that the inventory addresses. Instead, we deal with three elements that have a bearing on the process of industrialisation: 1) the differential growth in numbers of industrial sites in the sectors; 2) the evolving size characteristics of manufacturing premises; and, 3) the spatial distribution of manufacturing during the period. By focusing attention on these elements, it is possible to illustrate a number of fea-

tures about the industrial transformation of Montreal.

The number of manufacturing establishments

Table 3 summarises the totals of inventoried firms in each of the industrial sectors. We have no means of comparing the results we determined for 1861 with any other source. However, the totals for 1890 may be compared with the Census for 1891, and the numbers for 1929 with the tabulations of the Dominion Bureau of Statistics for 1930. Significant discrepancies exist. For example, the 1890 inventory total of 1,351 is markedly lower than the 1891 Census tally of 1,974, while the 1929 total of 3,942 is a great deal larger than the 1,795 count of the DBS. Several factors may explain the discrepancies. First, there is the difficulty of differentiating between retailing and manufacturing in many small establishments, especially in the leather and clothing industries. Our relatively catholic approach to defining such businesses may help explain the divergence between the 1890–1891 data sets. The discrepancy between the 1929 survey totals and the 1930 DBS count may again be due to definitional differences, especially the exclusion of firms employing fewer than five persons from the DBS tabulations.

Because we have used the same source for each of the selected years, with a consistent set of criteria used to include or reject an entry, the data we have collected are more appropriate for making comparisons between years.

Several points are worth noting from Table 3. First, there was sustained growth in the number of establishments. The 1861 total represented a near doubling of the 329 sites we had inventoried for 1825. Between 1861 and 1890 the totals more than doubled, while between 1890 and 1929 the number of establish-

ments increased by over 80%. While our data do not reflect the true cyclical nature of the changes, with periods of retrenchment as well as expansion, they do indicate a very strong growth surge overall. Clearly, any sign of corporate concentration is not possible from such data. Firms may have retained their original names even after a corporate merger. However, the size of the growth between 1861 and 1929 suggests that the concentration in the organisation of industry that was certainly taking place had little impact on overall numbers.

Second, there was a degree of sectoral concentration of manufacturing in Montreal. The city is well known for a number of industrial types, and there exists a general impression that Montreal was characterised by a relatively narrow industrial base. The data suggest otherwise. Certainly, the degree of specialisation weakened over time. In 1861, for example, the top three industrial sectors accounted for 51.3% of all establishments, and the five leading sectors represented 76.9% of the total. In 1890, the three leading industries accounted for approximately the same share as before—52.7%, but the share of the top five fell to 70.4%; and, in 1929 the top three represented 48.1%, and the top five 65.6%. This trend indicates that industrialisation progressed in Montreal through an expansion in the range of industries represented.

Finally, there was stability in the rank-size positions of the industrial groups. With notable exceptions, most sectors retained their relative positions throughout the period. This stability is remarkable when all the social, economic, political and technological changes that impacted on manufacturing between 1861 and 1929 are considered. Exceptions were the leather and transportation industries, which experienced declines in their absolute and relative importance,

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**Table 3: The Industrial Sectors of Montreal,
Numbers of Establishments and Evaluations**

	1861		1890		1929	
	%Estabs	%Evals	%Estabs	%Evals	%Estabs	%Evals
Food & Beverage	16.6	21.7	14.3	15.1	12.8	16.0
Tobacco	.5	.7	2.4	3.4	1.9	2.5
Chemicals	3.7	4.3	2.7	4.9	6.1	7.6
Leather	16.3	4.1	8.1	7.5	5.7	4.0
Textiles	1.4	1.3	2.1	8.5	4.9	7.6
Clothing	12.9	18.8	20.8	14.7	23.1	14.8
Wood	12.6	8.2	9.5	8.9	5.9	3.8
Paper	.3	.1	1.0	1.8	1.4	2.1
Printing	3.7	3.5	7.2	6.4	11.4	5.6
Metals	18.4	15.3	17.7	15.3	12.2	15.0
Transport	6.1	9.5	5.5	8.0	2.4	8.6
Electrical	–	–	.4	.8	.9	2.7
Non-metallic	3.4	1.5	1.5	1.3	3.6	7.1
Others	5.0	2.8	7.0	4.2	5.4	2.9
TOTALS	631	148*	1,351	756*	3,942	7,018*

* values in \$x000

while the clothing and printing industries became increasingly significant. Montreal's leading sectors, as defined by those occupying a ranking among the top five between 1860 and 1929, included the food and beverage, leather, clothing, wood, chemicals, printing, and metals industries. While the placing of the first three groups among the top industries is not unexpected, the last four are not usually so strongly associated with Montreal. Certainly, they have not received the attention from historical researchers that their apparent importance demands.

The size of firms

Our measure of firm size, the municipal water tax evaluation, is an imperfect surrogate. As a reflection of the value of the building, it may not indicate the size of

the enterprise in several cases. But the more common measures, such as number of employees, capitalization, and value-added, are unavailable prior to 1871, the year of the first Federal Census. Nevertheless, the utility of water tax assessments in historical industrial research has been established.¹⁴

An indication of the general size of firms in a sector may be obtained by comparing the differences between their numerical share of industry overall and their share of evaluations. If the percentage share of evaluations for a group is larger than its percentage numerical share, this would suggest that, on the whole, its premises are relatively large.¹⁵ Consistently high ratios are noted for the food and beverage, tobacco, chemicals, transport equipment, and electrical products sectors between 1861 and 1929. Other

sectors, such as textiles, paper, metals, and non-metallic minerals, began with premises that were relatively smaller and ended with more highly assessed premises in 1929. The only sectors whose percentage evaluations were consistently lower than their numerical shares were the leather, printing, and miscellaneous sectors (which include the jewellery industry). The clothing industry, which in 1861 had relatively high assessments, ended the period under review with relatively smaller scale operations.

The data confirm one of the main hypotheses concerning the process of industrialisation: that there is a deepening of capital investment in plant and equipment because of the drive to achieve scale economies.¹⁶ In Montreal, most manufacturing groups evidenced a relative growth in plant assessment. On the other hand, Montreal's leather, printing, clothing and jewellery industries remained largely small scale, as befits labour-intensive activities.

The spatial distribution of industries.

Figure 1 reveals the spatial distribution of manufacturing by size during the first growth phase in 1861. The importance of the St. Lawrence River was very evident, as there existed a linear industrial corridor parallel to the shoreline. The greatest concentration of industry in this corridor, however, was in the city centre. This industrial agglomeration was made up of businesses of all sizes, but it is apparent that many of the larger firms in the city were located here, particularly between the river and rue Notre-Dame. This is somewhat unexpected, given the mixed residential and commercial nature of the area at this time.

The map also reveals the establishment of industrial suburbs. The most notable was the extension of industry into the south-western sector along the banks of

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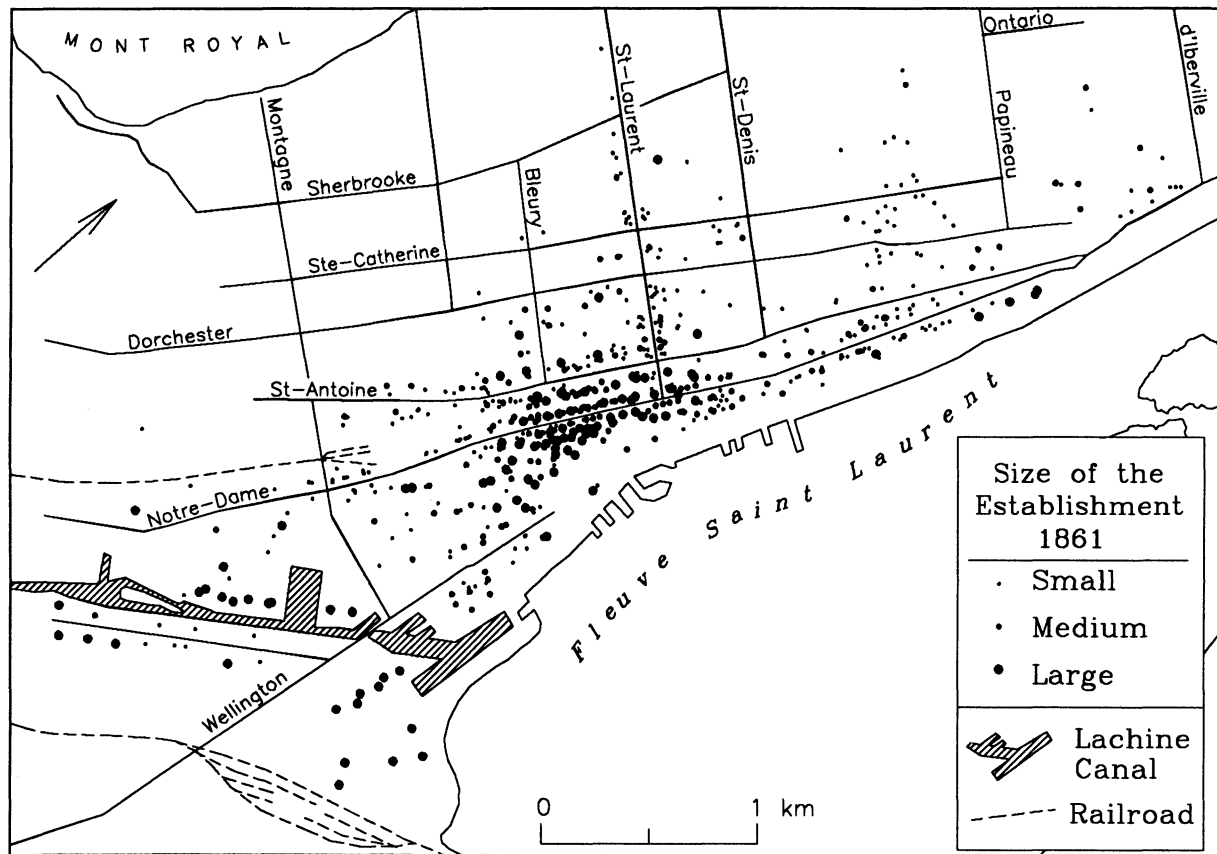


Figure 1: All Industries 1861.

the Lachine Canal. It was here that major large-scale factories were established. Noteworthy were the shops of the Grand Trunk Railway, flour mills, and textile mills. Adjacent to the Lachine Canal itself very few plants were small scale, although in Saint-Ann ward 40 per cent of the firms had evaluations less than half the average for manufacturing as a whole.¹⁷

Two other industrial extensions were visible at this time. On the northern fringe of the central core, following boulevard Saint-Laurent as far north as rue Sherbrooke, was the precursor of the future major concentration of clothing firms. East of rue St-Denis was a lesser

concentration of mixed industries. In contrast to the new industrial suburb being established adjacent to the Lachine Canal, establishments in this eastern zone were predominantly small and medium size.¹⁸

The distribution of industry in 1890 (see Figure 2) reveals both an intensification of manufacturing, commensurate with a doubling of numbers, and continued spatial expansion. Existing industrial districts were building up their numbers, and extensions to former suburbs were developing. Over all, the distribution assumed the form of an upside-down 'T'

The city centre, at the junction of the two bars forming the ⊥, still harboured the largest number of firms. The eastern and western suburbs, that formed the base of the ⊥, are now further extended than in 1861. However, it is noteworthy that the patterns were less linear than before, as industry had begun to infill in adjacent areas. The industries south-west of the city centre now extended from the banks of the Lachine Canal northwards as far as rue Saint-Antoine. In a similar fashion, the eastern industrial zone extended back from the river as far as rue Ontario. The distinction between the two industrial suburbs in terms of size of establishments was now less striking. Certainly, there was still a predominance of large

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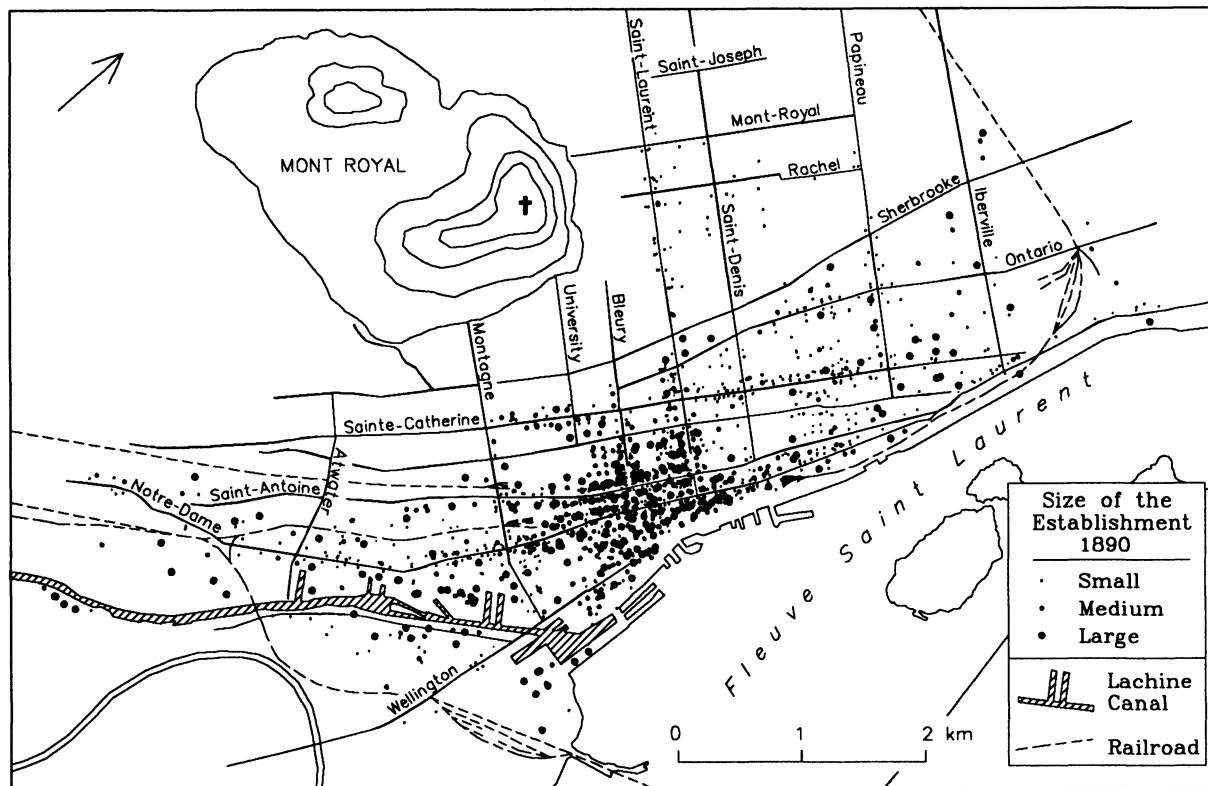


Figure 2: All Industries 1890.

firms adjacent to the Lachine Canal, but the industrial extension towards rue Saint-Antoine appears to have been more an outgrowth of Old Montreal, with its diverse base of small factories.¹⁹ On the outer margins of the eastern industrial zone, especially east of rue Papineau, new large establishments were established.

The trunk of the \perp comprised the linear zone extending north from the central area along boulevard Saint-Laurent. While its antecedent in 1861 reached only as far as rue Sherbrooke, by 1890 it extended as far north as rue Mont-Royal.

Figure 3 reveals the patterns of industry for 1929. The growth of manufacturing in

Montreal was indicated spatially through a continuation of previous trends: an intensification of manufacturing in existing zones, and extensions into adjacent areas. The over-all shape of the upside-down 'T' continued. The downtown area was still a major industrial region, and intensification produced several remarkable industrial agglomerations, particularly of the clothing and printing industries. Noteworthy was the exceptional cluster of clothing firms at the intersections of boulevard Saint-Laurent and rue Bleury with rue Ontario.²⁰

The south-western sector maintained its industrial character, and manufacturing was now spreading out particularly in the Saint-Henri and Sainte-Cunégonde wards. However, the spatial expansion

was not as pronounced as in other industrial suburbs. Considerable industrial growth was taking place in the eastern zones. Here, much expansion followed the Canadian Pacific railway track in Hochelaga-Maisonneuve.²¹ The trunk of the \perp , too, was maintained, and its northern extension had reached out as far as boulevard Jean-Talon.

If the geographical pattern discussed so far has been one of repeating and extending trends already established, a new industrial region was being formed by 1929. East of rue Saint-Denis and north of rue Rachel, a more dispersed manufacturing zone was evident. The location appears to have been determined by the very large labour force offered by the surrounding residential

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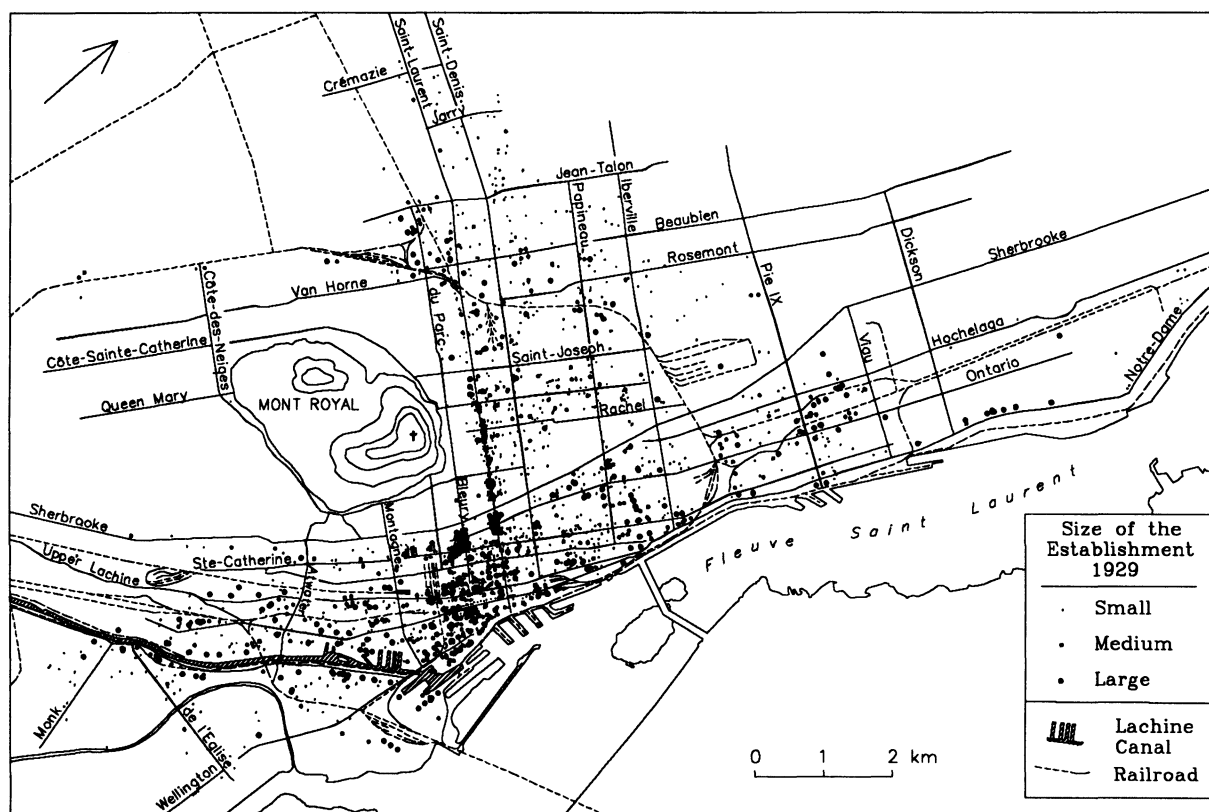


Figure 3: All Industries 1929.

areas, by the opportunities for rail transport afforded by Canadian Pacific's 'belt-line', and by electrification.²²

The geographical patterns described above confirm some expected features of Montreal's industrialisation. The importance of the eastern and southwestern zones has been well researched,²³ and through studies of the clothing industry, the agglomerations along boulevard Saint-Laurent may have been anticipated.²⁴ The importance of transport and labour force as locational determinants²⁵ are very evident in the actual distributions of manufacturing. However, there are a number of features that were not anticipated, at least to the degree manifested. The stability of the patterns is sur-

prising. Despite all the changes that were occurring in the extent of industry itself, in technology, and in markets, geographical distributions show considerable inertia. Spatial growth appears to have been brought about largely through accretion from existing industrial areas, so that while there was an evident extension of manufacturing, it conformed to a basic pattern already established.

The persistence and degree of importance of the city centre²⁶ as an industrial region is another feature that is somewhat surprising. Despite the growth of manufacturing in the adjacent suburbs, the downtown core maintained its status as an area with a very high concentration of manufacturing in every period.

Although the clothing industry helped the central area retain its industrial importance by 1929, it was by no means a single-industry region. It may have sheltered artisanal businesses longer than elsewhere, and hence served as a region of vestigial pre-industrialisation. Equally, it may have served as an incubator, where new businesses and processes are tested and launched. Given these possibilities, it would be worthwhile to trace the locational and structural changes of businesses in central Montreal at this time.

While the industrialisation of Montreal is usually explained in terms of the size of local markets, its labour force, the availability of capital, and its supremacy as a trans-

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port centre, energy has been less frequently considered. Certainly the hydraulic power made available from the Lachine Canal has been cited as a critical factor in the industrialisation of the south-west sector of the city²⁷, but the role of electricity has rarely been invoked in the later stages. Yet the 1929 map hints at a degree of decentralisation of firms in the north-east of the city that broke a century-long tradition of industrial concentration. How the availability of electricity and its provision to various urban areas influenced the spatial pattern of manufacturing would be a useful study²⁸.

The Food and Beverage Industry

It is evident that the pattern of industrialisation sketched above is made up of the disparate developments of a number of individual industries. The formation of each of these sub-groups was distinctive, so that the general trends observed for particular sectors, such as growth, increasing scale and spatial diffusion, may not apply to the same degree to individual cases.²⁹ In order to examine some of these discordances and differences we focus on the food and beverage industry.

This is a particularly appropriate case study because it was one of the leading industrial sectors in Montreal during the period, accounting for between 12.83% and 16.6% of all manufacturing establishments. Moreover, it was a very diverse sector, comprising meat and poultry products, fruit and vegetable processing, bakeries, dairy products, flour milling, soft drinks and breweries. The processes that transformed all these industries did not follow the same rhythm. Size and scale varied considerably, and in some cases artisanal modes of production lasted well into the twentieth century.

General Features

Inventory data indicate that the food and beverage sector possessed a number of important characteristics. The industry maintained a healthy rate of growth throughout the period. According to the inventory for 1861, there were 104 firms in the food and beverage sector (see Table 4). These numbers grew to 193 in 1891 and 313 in 1929. They coincide very closely with Census and DBS tallies: 103 in 1871, 173 in 1891, and 293 in 1930.³⁰ Numerically, bakeries comprised the largest category, but as time progressed their sectoral share fell from 71% in 1861 to 47% in 1929. This demonstrates that the food and beverage industry, as with manufacturing in general, exhibited growing diversity. Over the period, many new types of food processing industries were established, which both broadened and extended the industrial base of the city.

Inventory data also hint at the capital intensity of the food and beverage sector. Table 3 suggests a relatively high evaluation for food and beverage establishments. Census data confirm this. As early as 1871, the industry which represented only 6% of the labour force, accounted for 27% of the value of all industrial output in Montreal. This remarkable share was maintained throughout the period, even growing to 30% in 1891, but slipping back to 24% in 1931.

The spatial distribution of the sector reveals some divergence from overall industry distribution (see Figs 4, 5 and 6). While there were food and beverage establishments in the city centre, their degree of concentration was much less there than general industry patterns. In 1861, establishments of the highest evaluations were located east and west of the central area, south of rue Notre Dame. This pattern is repeated in subsequent years, although there is a trend

towards the decentralisation of the larger plants into the northern and eastern areas of the city (see Fig 4).

Numbers and Diversity

Although the food and beverage industry experienced an increase in the number of establishments between 1861 and 1929, the rate of growth was below that of industry in general. The sector increased by 85.5% between 1861 and 1890, compared with 114.1% for all industries, and by 62.2% between 1890 and 1929, compared with 80.8% over all. These data mask where the actual growth was taking place. Numerically, the largest sub-groups of 1861 were the bakeries and beverage industries (see Table 4). In subsequent years, their relative importance declined, as new types of food industries appeared, such as fruit and vegetable processing, meat and poultry, and dairy products. These newer industries accounted for an increasing share of the total sector over time.

This is not a unique development. The process of industrialisation includes the appearance of new manufactures as innovations and inventions play a significant role in urban-industrial development.³¹ The role of technology has already been studied for certain Montreal industries, such as foundries,³² but there has been little research on the processes that led to the diversification of the food industry.

Although technological developments, such as canning and freezing, may be hypothesised as a factor in the diversification of the food industry, it was by no means the sole cause. The industry is market oriented (see below) and the changing composition of Montreal's population, in particular the immigration of very large numbers of eastern Europeans, led to changes in the food and beverage industry. The demand for different

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Table 4: The Food and Beverage Industry

	1861		1890		1929	
	Estabs	Evals	Estabs	Evals	Estabs	Evals
Meat & Poultry	–	–	8	20	23	109
Fruit & Vegetable	1	0	5	2	16	27
Dairy Produce	–	–	–	–	15	71
Flour Mills	4	8	4	12	6	82
Bakery Products	74	7	124	33	149	198
Misc. Food	5	6	18	20	58	289
Beverage & brewing	20	11	34	26	47	345
TOTALS	104	32	193	114	313	1,123

(Evaluations are in \$x000)

types of food hitherto not produced locally led to the establishment of new industries, frequently by immigrant entrepreneurs.

Capital Intensity

The food and beverage industry as a whole was one of the most highly capitalised sectors in Montreal. As such it was one of the leaders in the transformation from an artisanal mode of production. Flour milling was one of the earliest examples of large scale manufacturing in the city. In 1861 there were only four flour mills, and they alone accounted for 6% of all industrial evaluations. Of these, City Mills, Canal Flour Mill, and Ogilvy Flour, dominated production. City Mills was established by Ira Gould in 1847, and possessed a daily capacity of 800 barrels. Ogilvy Flour had begun operations in Montreal on a small scale in 1811, but in 1837 a new factory was established that was the largest industrial building in the city at the time.³³

Another early example of large scale manufacturing in the food and beverage sector was sugar refining, whose production was even more concentrated. Two companies alone controlled the output, and in 1871 they accounted for 12% of the value of all industrial production in Montreal.³⁴ Redpath Sugar (later renamed the Canada Sugar Refining Co.) was the industry leader throughout the period. Established in 1854, it occupied premises seven stories high. The second firm was Molson Sugar Refining that went out of business in the 1870s and was replaced by the St. Lawrence Sugar Refining Company.

These industries present a particular, though not entirely unique, aspect of the industrialisation process. They exhibited from the beginning two of the essential features of industrial transformation: large scale production, and concentrated ownership. In many other industrial sectors, increasing output was followed somewhat later by a concentration of ownership, frequently through mergers and acquisitions.

In the food and beverage industry, the more typical sequence is well illustrated by the breweries. They were among the first to shift from artisanal production methods. New beer-making technologies such as fermentation tanks, the heating and drying of grain, and bottling were adopted in the early nineteenth century by a number of firms in Montreal, most notable of which was Molson's.³⁵ Although Molson's is the best known brewery, there were several other companies that competed with the industry leader, such as Dawes, Dow, Eckers, Union and Canadienne. Throughout the nineteenth century the industry took on an increasing industrial character, and the plants underwent a series of transformations to accommodate the new processes. The trend towards corporate concentration came about in 1909, when most of the existing major breweries, with the exception of Molson, merged to form National Breweries. The new corporation immediately began to close several existing plants, concentrating output at the larger more profitable factories.

If the food and beverage industry can be shown to have been one of the most highly capitalised industries in Montreal from a very early period, its numerically largest sub-group, bakeries, constituted an industry that retained its artisanal character for a very long time. Individual firms were mainly small, employing few workers in small premises, frequently adjacent to retail outlets. Their numbers continued to increase throughout the period, and by 1929 there were 148 bakeries in Montreal. The industrial transformation of the bakery industry as a whole came about after the 1930s, when the flour milling industry began to invest in productive capacity, adopting the latest technology of large scale manufacture.³⁶

While the bakery sector as a whole was characterised by small-scale establishments throughout the period, there were

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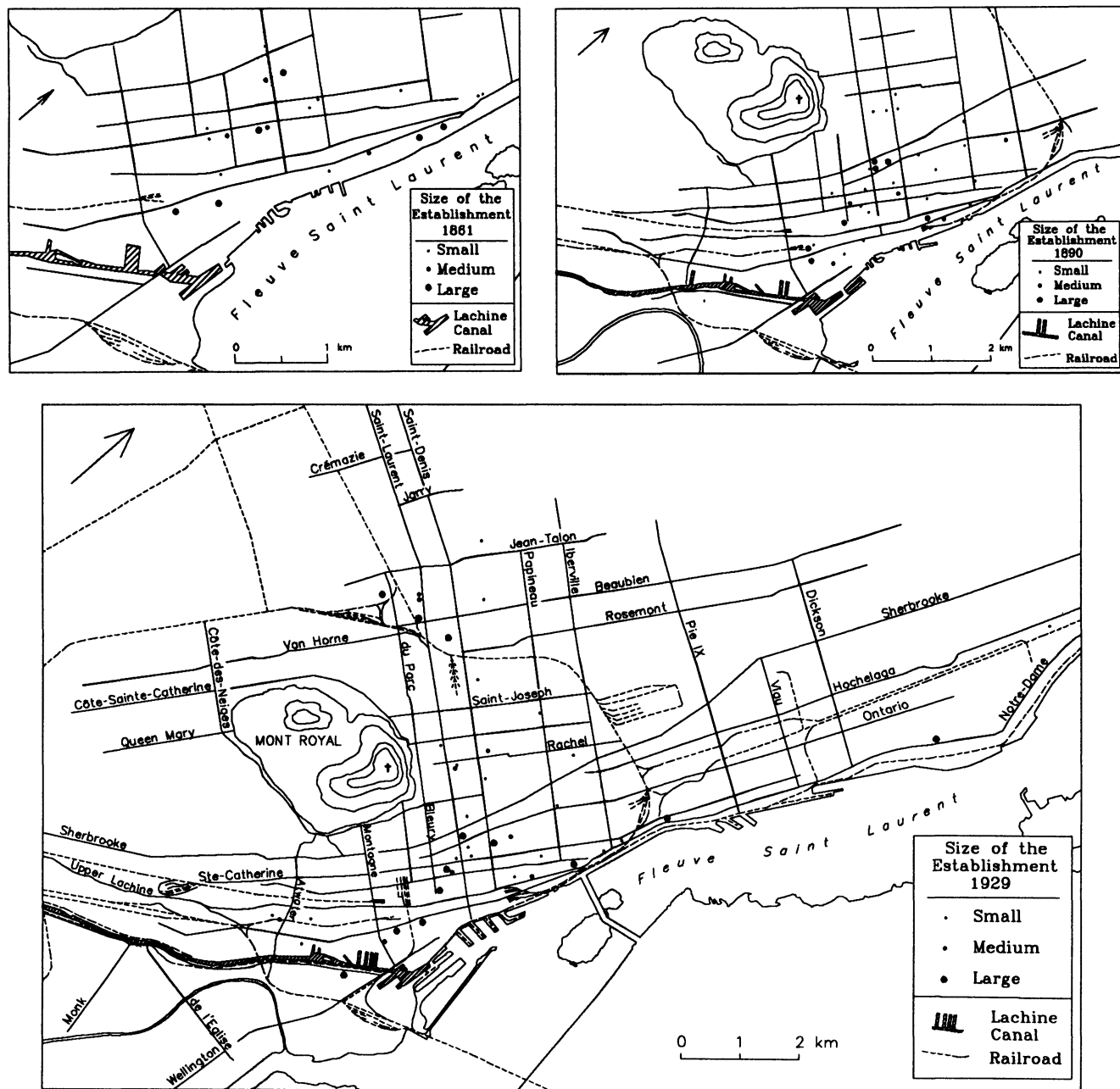


Figure 4: Food and Beverage Industries 1861, 1890, 1929.

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examples of a few firms that pursued scale economies, and achieved an industrial character even in the nineteenth century, such as Anderson, Findlay, McGill, Viau et Viger, and Robb.³⁷ These firms adopted steam-baking processes, and several began to specialise in particular baking products, such as biscuits in the case of Viau.

Spatial patterns

The geographical distribution of the food and beverage industry that was hinted at previously provides strong indications of the main forces that shaped it. In Weberian terms,³⁸ the food and beverage industry is one that is relatively footloose, because its markets are ubiquitous, as are many of its raw materials. However, because it involves manufacturing processes that generally increase the weight of the finished product (such as the beverage industry) or add to the perishability of the product such as bakeries, it tends to be an industry that is market oriented. Market orientation partially explains Montreal's importance as a centre of food processing, because of its size as the largest urban agglomeration in Canada. This orientation also helps the interpretation of intra-urban spatial patterns. The dispersed distribution of the beverage industry and bakeries is a reflection of these forces (see Figs 5 and 6).

However, the diversity of the industry in size, scale and processes, indicates that processes other than market influences helped shaped the food and beverage sector. The sub-groups that experienced the earliest transformation to industrial modes of production, flour milling and sugar refining, were strongly influenced by two other factors that reflected on their locational choices. Because their scale of operations required large quantities of raw materials, and because their productive capacity made them depen-

dent on markets beyond Montreal itself, they were very reliant upon transportation, shipping in particular. Their establishment in the city coincided with the developments that were being made to improve water access above and below Montreal on the St. Lawrence River in the 1840s and 1850s. In addition, they required a source of power to drive the rolling and grinding machines. In Montreal, hydraulic power and transportation came together on the Lachine Canal. It is not surprising, therefore, that Montreal's largest factories were built along its banks, helping create the city's first major industrial suburb.

The scale of some of the early food and beverage enterprises implies another factor of production—capital. The names of many of the leading firms, Ogilvy and Redpath, confirm the links identified by Tulchinsky³⁹ between the old merchant princes and the industrialisation of Montreal. Their access to capital permitted the construction of extensive factories on large sites. Although they were frequently subjected to successive modifications and enlargements, they tended to remain locationally fixed. Other industry leaders obtained capital from the accumulation of profits of previous manufacturing activities. Immigrants, such as Ira Gould, a miller from Upper New York State, contributed technical expertise as well as capital.

The formation of locally-produced industrial capitalists provide some intriguing spatial questions. The growth of their firms and the resultant deepening of capital may have resulted in locational shifts. Their growth frequently necessitated a change of premises. An example of the process is provided by one of the leading confectioners, Viau Biscuits.⁴⁰ In 1866, Charles-Theodore Viau purchased the grocery store from his employer located on Commissioners Street, adjacent to the port. He quickly decided to

specialise in processing and wholesaling flour products. In 1867, the enterprise was baking and selling bread, and shortly thereafter began manufacturing biscuits. In the early 1870s, growth resulted in the firm relocating Notre Dame Street, but the factory was destroyed by fire in 1875. This calamity afforded the opportunity to enlarge the plant and introduce new machinery, which resulted in greater production. In 1890, Viau ceased bread making in order to specialise in biscuit manufacture. At that time the firm employed 125 workers, and was one of the largest producers of biscuits in Canada. In 1906 a new plant was built that still stands on rue Ontario in Hochelaga-Maisonneuve.

The history of Viau seems typical of manufacturing development of locally-based firms. Specialisation led to enhanced output and increased market share. This, in turn, resulted in an outward locational shift, as the company built newer and larger factories.

Conclusions

This paper has provided a glimpse of the complexity of historical industrial development in Canada's largest city between the 1840s and 1929. Despite their obvious limitations, the data contained in the inventory confirm many of the elements of the process of industrialisation that other research has established. However, the images provided by the maps for 1861, 1890 and 1929, suggest that many research questions remain unanswered.

The process of industrialisation of Montreal contains a number of paradoxes. It was marked by considerable growth of industrial infrastructure, and many new types of manufacturing processes were introduced; yet there was considerable stability in the rankings of the leading sectors throughout. Some sectors

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Figure 5: Bakeries 1861, 1890, 1929.

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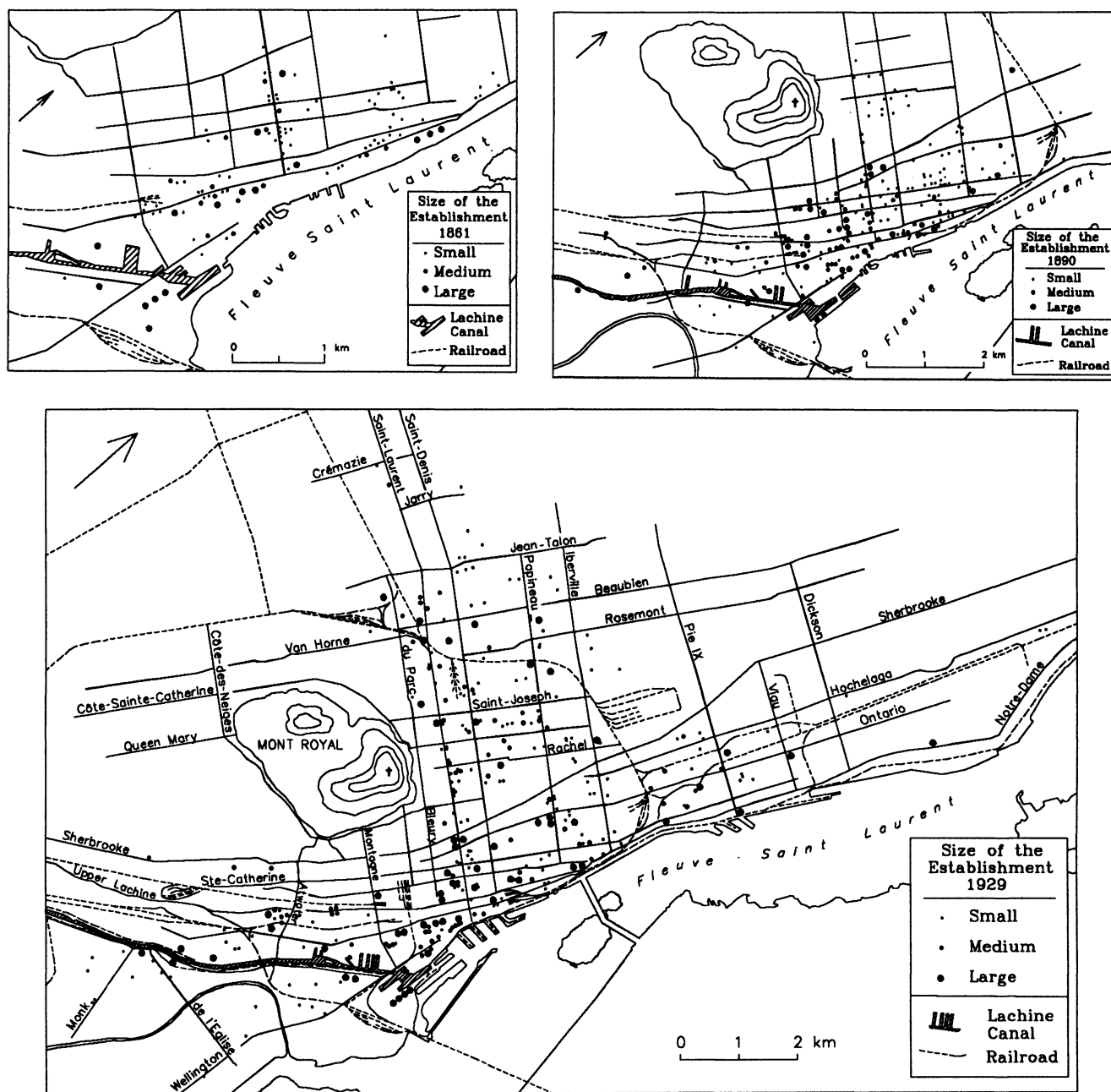


Figure 6: Breweries 1861, 1890, 1929.

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mechanised rapidly, and output became concentrated in fewer and fewer units of production; yet even within the same sector, pre-industrial modes of production persisted for a considerable time.⁴⁰ As manufacturing progressed through the nineteenth century, a spatial expansion of industry occurred, with new industrial suburbs being established; yet the patterns reveal considerable geographical inertia, as the basic structure of the industrial geography of Montreal changed little.

These apparent inconsistencies point to the difficulty of generalising about Montreal's industrialisation. They indicate the need for a much greater understanding of the evolution of individual sectors, and particular industrial districts. It is here that our data may have a contribution to make, both as illustrative material, and as suggestive of new research directions.

Notes

* The authors wish to thank two anonymous reviewers for their comments, and Robert Lewis for his extremely useful suggestions.

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15. It must be recognised that this ratio can be distorted by the existence of a few large plants in a sector that is otherwise made up of smaller units, as is the case of the tobacco industry.
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