Urban History Review
Revue d'histoire urbaine

URBAN HISTORY REVIEW
REVUE D'HISTOIRE URBAINE

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Volume 22, numéro 2, june 1994

URI : https://id.erudit.org/iderudit/1016713ar
DOI : https://doi.org/10.7202/1016713ar

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Éditeur(s)

Urban History Review / Revue d'histoire urbaine

ISSN

0703-0428 (imprimé)
1918-5138 (numérique)

Découvrir la revue

Citer cet article

Gad, G. (1994). Location Patterns of Manufacturing: Toronto in the Early 1880s. *Urban History Review / Revue d'histoire urbaine*, *22*(2), 113–138. https://doi.org/10.7202/1016713ar

Résumé de l'article

Les publications sur les villes réduisent à leur plus simple expression la structure industrielle et les schémas de localisation des entreprises manufacturières des zones urbaines du dix-neuvième siècle; la seule notion de changement qu'on y trouve se limite exclusivement aux innovations sur le plan de la technologie des transports au tournant du siècle ou par la suite. On peut rejeter cette orthodoxie pour diverses raisons. La recherche empirique sur Toronto, et sur d'autres villes, a permis de constater qu'il existait, au début des années 1880, des industries dont la taille, les capitaux, les caractéristiques de la main-d'œuvre et les liens intrants-extrants variaient considérablement. Les schémas de localisation des industries allaient d'industries hautement centralisées aux industries dont les manufactures étaient très dispersées. On n'a constaté toutefois aucune relation directe entre la taille et les capitaux d'une part et le schéma de localisation de l'autre.

Location Patterns of Manufacturing: Toronto in the Early 1880s

Gunter Gad

Abstract:
The literature on cities simplifies both industrial structure and location patterns of manufacturing in nineteenth-century urban areas, and it conceives of change narrowly in terms of innovations in transportation technology at or after the turn of the century. There are many reasons for rejecting this orthodoxy. Empirical research on Toronto, and other cities, recognizes industries of different scale, capital intensity, labour characteristics, and input-output linkages in the early 1880s. Location patterns for different industries varied from highly centralized ones to those characterized by a great dispersion of factories. There was, however, no straightforward relationship between scale and capital intensity on one hand and location on the other.

Résumé:
Les publications sur les villes réduisent à leur plus simple expression la structure industrielle et les schémas de localisation des entreprises manufacturières des zones urbaines du dix-neuvième siècle; la seule notion de changement qu'on y trouve se limite exclusivement aux innovations sur le plan de la technologie des transports au tournant du siècle ou par la suite. On peut rejeter cette orthodoxie pour diverses raisons. La recherche empirique sur Toronto, et sur d'autres villes, a permis de constater qu'il existait, au début des années 1880, des industries dont la taille, les capitaux, les caractéristiques de la main-d'oeuvre et les liens intrants-extrants variaient considérablement. Les schémas de localisation des industries allaient d'industries hautement centralisées aux industries dont les manufactures étaient très dispersées. On n'a constaté toutefois aucune relation directe entre la taille et les capitaux d'une part et le schéma de localisation de l'autre.

Introduction

"In order to afford better accommodation for his increasing business", Francis H. Medcalf moved his foundry, where he produced steam engines and mill machinery, from the Yonge Street/Queen Street area to King Street East near the Don River in 1858.[1] Although this kind of move from the edge of an emerging central business district to the thinly developed fringe of the city was a rare occurrence at this time, it is nevertheless indicative of the continuous changes to which manufacturing activity was subject. Ever-present adjustments in the location pattern of manufacturing establishments led to a differentiated industrial landscape at any cross-section in time. The decentralization of manufacturing within the city cannot be understood in the context of a narrow range of technological innovations, such as the electric streetcar, the motor truck and the single-floor plant associated with the advent of electric motors. In stressing the diversity of locations in the early 1880s, this paper contributes to the extrication of our images of the nineteenth-century city from technological determinism.[2] More realistic appraisals of manufacturing location and locational dynamics in the nineteenth-century city are, of course, also important for a reasonable understanding of the economic geography of the city, including retailing, wholesaling and office-based activities, the residential and social geography of the city, the evolution of intra-urban transportation, and the relationships between industrial and other interests.

This study of industrial location in Toronto of the 1880s focuses on the diversity of industries and the elements of production which differentiated them: different amounts of capital and labour, different kinds of labour, different input structures and markets, and different transportation and space requirements. This approach owes a great deal to Allen Scott's earlier work on the intra-urban location of manufacturing, although it is critical of it and seeks to go beyond it.[3] The work by Muller and Groves on Baltimore and by Lewis on Montreal are judged here as important contributions to be built on.[4]

Spatial Patterns of Manufacturing in Cities: Generalizations and Conceptualizations

The literature on North American cities contains a fairly simple image of urban spatial structure and the changes affecting spatial patterns. The "mainstream" view suggests that in the nineteenth-century city, economic activity, including manufacturing, was located "at the core of the city" or "in the city centre". This core or centre was surrounded by residential areas. After 1900, the location pattern of manufacturing changed: manufacturing became "decentralized" or "suburbanized". The reasons for this change are seen in mounting congestion in the core of the city and in the advantages which newly-developing peripheral areas offered in terms of ease of movement by motor truck and the possibility of constructing single-floor plants.[5] This "mainstream" view is open to criticism on a number of counts. First, it omits location changes and locational diversity in the nineteenth-century city. Secondly, it is remarkably insensitive to the diversity of industries and their specific locational requirements and location strategies. Most importantly, by emphasizing changes in transportation technology and cost, it conceptualizes location issues narrowly in the form of location parameters external to the manufacturing process.

In contrast to the "mainstream" view, Allen Scott seeks the impetus for change within the process of capital accumulation.[6] According to Scott, and here he

agrees with the "mainstream" position, "industrial firms of all kinds ... in the nineteenth-century metropolis tended universally to gravitate towards the urban core."[7] However, manufacturing in the nineteenth-century metropolis was differentiated. One type of industry was large-scale and materials intensive, such as meat packing, raw iron production or foundry work. These industries relied on heavy and/or voluminous inputs in relation to outputs and, because intra-urban transportation by horse and cart was very expensive, this kind of manufacturing activity "sought out locations in close proximity to central rail and water transport terminals."[8]

Labour, on the other hand, was more mobile and could find relatively easy access to these "central" industrial clusters. The second kind of industry consisted of small, labour-intensive firms, manufacturing articles such as clothing, shoes, jewellery, and furniture. They were characterized by unstandardized products and involved inputs and input linkages which were also difficult to standardize. Therefore, innumerable small production units were "held together as functional and spatial entities." [9] Because of a massive collective demand for labour, these spatial clusters were also found in central parts of the city, where they, like the large-scale, materials-intensive industries, could also take advantage of the high accessibility to labour. From the turn of the century onward, this pattern has changed, according to Scott. While small-scale, labour-intensive firms have remained in central locations, large-scale, capital-intensive firms have steadily dispersed away from the core areas. Scott places this process of spatial change in the context of technical progress and capital intensification. The argument is as follows: as the accumulation of capital proceeded, the amount of capital per worker (capital/labour ratio) grew and an increasing efficiency of production was achieved. Increasing efficiency also implied an increase in the ratio of outputs to inputs and thus the locational dependence of factories on material inputs was reduced. At the same time, intra-urban transportation became cheaper, which also lessened the dependence of large-scale, material-intensive manufacturing on central sites. Now these kinds of manufacturing activities could take advantage of cheap peripheral land and, at least initially, cheaper wage rates. If wage rates rose due to increasing competition for labour in inaccessible peripheral locations, firms could still benefit from savings in land costs. Higher capital inputs, of course, also rendered labour costs less critical. In this process of change, firms became larger, achieved greater internal economies of scale, engaged in vertical and horizontal integration and thus, reduced the complexity and cost of input and output linkages. Scott's emphasis on the changing relationship of capital and labour is important and will be used as the major vantage point from which the location of manufacturing in nineteenth-century Toronto is viewed. However, Scott's account of the locational dynamics of manufacturing also has some shortcomings. First, the whole range of manufacturing activities is collapsed into only two major types, and secondly, as in the "mainstream" argument, the historically-specific period of change is believed to have started at the turn of the century.

There is considerable empirical material available to argue that the spatial patterns of manufacturing in the nineteenth-century city were far more complex than those insisted upon by either Scott or the "mainstream" literature. One recent detailed study is Lewis' account of the emergence of peripheral industrial districts in nineteenth-century Montreal.[10] Appropriately, this study builds on that of Baltimore by Muller and Groves, who document the spread of capital-intensive, large-scale factories, such as flour milling, distilling, tanning, brewing and foundry work, across non-central districts by 1860.[11] On the other hand, clothing and printing were strongly concentrated in central locations. The patterns visible in nineteenth-century Baltimore were also apparent in Chicago in 1873, as the study by Fales and Moses demonstrates.[12] There were industries, such as clothing, shoe, and cigar production, which were highly concentrated at the centre. There were activities, such as cut stone, upholstered furniture and wagon production, which were weakly represented at the centre, but strongly represented in a ring of .5 to 1.0 miles from the centre and more weakly beyond this ring. A third group of industries, including foundries and planing mills, were found throughout the city, but not in the central part. And finally, breweries and brick yards were found predominantly in peripheral locations. A similar spatial differentiation is documented for some European cities. Maps disclosing the distributions of selected industies in Paris of 1872 show printing as highly centralized, metal works strongly represented between centre and periphery and chemical works predominantly in peripheral locations.[13] Throughout the nineteenth century, spatial differentiation of manufacturing was also apparent in London, and both the scale and the separation of the different components of London's economy seems to have increased significantly after the middle of that century. Clothing, printing, jewellery and precision instrument making were highly centralized, furniture making was concentrated to a large extent at the fringe of the built-up area of 1850, and the "waterside" and heavier metal industries were found downriver in the newer eastern parts of London.[14]

What is even more important than the spatial differentiation of manufacturing at

any cross-section in time in the nineteenth century is the irrefutable evidence of the fluidity of location patterns. At least in the sample cities mentioned here—Montreal, Chicago, Baltimore, London and Paris—the spatial patterns of many industries changed. For example, "chemical works" in Paris went through a pronounced "decentralization" process between 1848 and 1872, with the largest cluster of these establishments appearing outside the city boundaries, even though these boundaries had been considerably extended in 1860. Metal-working firms experienced a less striking centrifugal displacement and printing firms stayed firmly entrenched at the centre. The numbers of all "large scale" manufacturing firms in the most central district of Paris increased between 1836 and 1848, but then fell in absolute terms between 1848 and 1872. Of course, in the peripheral areas, numbers increased rapidly throughout the 1836-1872 time period.[15] Muller and Groves provide a detailed picture of Baltimore's changing industrial geography. Between 1833 and 1860, "decline in the core" meant the loss of 100 manufacturing establishments. The "central business area's" share of all of Baltimore's manufacturing establishments declined from 47% to 15%.[16] By 1860, six industrial districts had emerged, and "four of the six districts were clearly not in or adjacent to the city's central area."[17]

The empirical observations reported here are part of the reason why a critique of both the "mainstream" account and Scott's explanations of the locational dynamics of manufacturing have surfaced. Lewis has already provided a systematic critique and it should be sufficient to summarize this briefly.[18] Lewis makes the point that most literature on the location of manufacturing fails to link changes within the city to changing "external pressures", such as the long waves of capital investment, technological change in production methods, and the advent of new industries based on new products. A second major point made by Lewis concerns the simplified treatment of the organization of manufacturing. Neither was there just one type of industry, nor is it sufficient to distinguish only between large-scale, material-intensive and small-scale, labour-intensive manufacturing activities. He draws attention to the diversity of organizational structures between and even within industries. A further point mentioned by Lewis concerns the political and social context in which changes within cities took place. He refers particularly to the local alliances which constructed built environments conducive to industrial growth. Indeed, there is plenty of evidence that not only was industry's demand for adequate physical infrastructure met, but direct bonusing, tax concessions and other forms of subsidies were provided. However, the political economy of the nineteenth-century city requires a far broader treatment than the search for growth alliances. Industrial capital often faced challenges, especially from other factions of capital. Harvey's analysis of the difficulties and challenges faced by manufacturing under Haussmann's reorganization of Paris is an excellent example. Here, massive decentralization was not a play of changing factors of production and location in a narrow economic sense, but was determined primarily by the political will of Haussmann and his "prince" (Napoleon III) to make room for commerce and new forms of urban life in a new city centre.[19]

A final point concerns the issue of transportation in the nineteenth-century city. Much of the "mainstream" literature potrays the urban areas as "pedestrian cities", where proximity between home and work was important. It is relatively silent about such questions as how far workers were able and willing (or forced) to walk, or at which point factories began to disperse in order to facilitate short journeys to work. There is hardly any discussion about the impact on the location of manufacturing by innovations in nineteenth-century passenger transportation, although some authors mention the introduction of special workingmen's fares on railways in Chicago and London in the 1870s.[20] Goods transportation in the nineteenth-century city, relying on water transport, railways and horse-drawn vehicles may have been cumbersome and expensive. However, whether this transportation system was static or experienced improvements, and what its historically-specific limitations were, has hardly been investigated.

Looking at Manufacturing in Nineteenth-Century Toronto: Points of View

The critique of the "mainstream" literature and Scott, as well as the detailed empirical work on manufacturing in the nineteenth-century city suggest a new research agenda that is obviously informed by discussions about the location of manufacturing in the twentieth-century city. This paper on Toronto, however, does not fulfill all the promises of a new research agenda. It is primarily concerned with documenting the diversity of locations of manufacturing activity in the early 1880s and it inquires about the characteristics of industries found in different locations. First, there is the question whether, according to Scott, large-scale, capital-intensive manufacturing had to wait until the twentieth century before it became "decentralized". Secondly, the question about a gradation in the process of capital intensification is raised. Were there industries, which fell in between the extremes of large-scale, capital-intensive and small-scale, labour-intensive, and were they located in intermediate locations, i.e. neither at the core nor at the periphery? The attempt here

does not provide an adequate explanation of location patterns in the nineteenth-century city. Many crucial aspects, which are necessary for a full understanding of the location of manufacturing in Toronto of the 1880s, are touched upon, but have not yet been systematically and adequately researched: the intensity of production per unit of land, the input and output linkages (including their geographic configurations and transportation requirements), the various production strategies adopted by individual firms, the detailed labour requirements and spatial configurations of labour markets (or the residential geography of the labour force), the transportation facilities and their constraints, and above all the social and political processes which shaped the conditions of production, especially the physical infrastructure and the land market.

The early 1880s are a particularly important period for an analysis of Toronto's geography of manufacturing. The factors that the "mainstream" literature held responsible for the "decentralization" of manufacturing were not in place at that time. Neither cars nor trucks were available. The electrification of the streetcar network only occurred between 1892 and 1894. Electric motors were not used. Single-storey plants only appeared in Toronto from 1893 on.[21] Although municipalities raided each others' industrial base, the move to suburbs separated from the city by political boundaries appeared only at the end of the 1880s.[22] Until then, urban development and the "decentralization" of manufacturing occurred within the administrative boundaries of the City of Toronto. Finally, with a population of 80,000, Toronto was a relatively small city in comparison to Montreal, Baltimore, Chicago, Philadelphia and, of course, Paris and London. In other words, industrial and locational diversity, it will be shown, was not dependent on enormous size. Apart from these considerations, the early 1880s are also of interest, because of the availability of data and previous research.[23]

The Diversity of Manufacturing in Early 1880s Toronto

The 1881 *Census of Canada*, provides a picture of the industrial structure of Toronto and allows for at least a crude characterization of the 92 different manufacturing activities that were represented. For each class of manufacturing or industry,[24] the following data are available for Toronto: number of establishments, employment broken down by gender and two age groups (over and under 16 years), total yearly wages, total value of raw materials, and total value of "articles produced".[25] Unfortunately, the amount of capital invested is not available by industry for Toronto. However, total employment and amount of capital invested is given for each industry in the Province of Ontario. These provincial figures are used here to indicate the capital-labour ratios which might have been valid for Toronto as well.[26]

According to the 1881 *Census of Canada*, Toronto's collection of industries was very diverse. The 870 establishments and 12,708 employees were found in no less than 92 industries, which suggests that each branch of industry was quite small. Table 1 lists 22 industries which either had 20 or more establishments or 200 or more employees. Only three industries had more than 1,000 employees (or more than about 8 percent) each: tailors and clothiers, printing offices, and boots and shoes. Other reasonably large branches of production, each accounting for between 3 and 4 percent of the total, included bakeries, tobacco working, dressmaking and millinery, and sash, door and blind factories, and suggest that consumer goods industries played an extremely strong role in Toronto's manufacturing sector. There were, however, quite a number of industries which manufactured intermediate products or producer goods. Flour mills supplied bakeries and biscuit manufacturers, varnish and paint works supplied a whole range of other industries, and show-case makers, office furniture manufacturers or carriage makers supplied equipment at least partially used in the process of capital circulation.[27] Many of the steam engines and other machinery used by Toronto industrialists were also manufactured in Toronto.[28]

Figures on the size of individual manufacturing establishments are not available for 1881. The small size of industries and other data for both 1871 and 1885 suggest, however, that Toronto was not a place of massive factories.[29] Altogether, there were probably no more than 40 to 50 factories with 100 or more employees in 1881. Only about five could count more than 300 workers: the Crompton Corset factory (about 350), the Massey agricultural implement works (400), Lailey's clothing factory (450), the Cooper boot and shoe factory (500) and the Hay furniture factory (575). All figures are estimates for 1885 and, in 1881, they were most likely considerably smaller.[30] Overall, the industrial character of Toronto was determined by small and medium size firms in many different industries. Not to be found in Toronto were huge employers capable of organizing industrial villages or districts and absent, too, were blast furnaces, large chemical plants, locomotive works or other "heavy" industries.

The discussion of Toronto's industrial structure and Table 1 are based on specific materials and products rather than on the organization of production. However, as Laurie and Schmitz have shown for Philadelphia (in the years 1850-1880) and the Bloomfields by means of Canadian 1871 manuscript census data, organizational structures could vary from

small artisans' craftshops to large factories with several gradations in between (measured in terms of employment) and mechanization (measured by use of power).[31] According to Scott, large-scale, capital-intensive manufacturing is associated with high wage rates, while small-scale labour-intensive production is associated with low wage rates and often high percentages of female labour.[32] While the data available in the 1881 census does not allow for a full characterization of Toronto industries at that time, information on scale, capital intensity, wage rates, and the percentage of female labour provide us with a useful picture. Surprisingly, the 1881 census does not provide data on the use of power. Another very significant limitation of the 1881 census data is the focus on whole industries, which hides potential differences within each class of industry. Some of these concerns are addressed by using 1871 census data on individual establishments in a supplementary fashion. After a brief discussion of the major features of organizational structure (Table 2 provides a synopsis) an inductively-derived typology of organizations is described.

Scale is measured here by the average of capital invested per establishment and average numbers of employees per establishment for each of 42 industries. Since the 1881 census does not provide information on capital invested for the industries of Toronto, Province of Ontario capital-labour ratios are multiplied by the average establishment employment size in each industry. Table 2 shows that the amount of capital invested varies very strongly, ranging from $778 per establishment in boat building to $274,000 in distilleries. Scale measured by employment is also extremely varied, with half of the 42 industries classified as "small" (2-17 employees on average). There is no perfect relationship between size measured by capital invested and size measured

Table 1 Toronto's Industrial Structure, 1881[1]

Major Industry Group and Industry Class	Establishments n	Establishments %	Employment n	Employment %
Food and Beverages	**83**	**9.5**	**952**	**7.5**
Meat curing	11	1.3	136	11
Bakeries	45	5.2	378	3.0
Breweries	10	1.1	220	1.7
Tobacco Products	**13**	**1.5**	**394**	**3.1**
Leather	**98**	**11.3**	**1434**	**11.3**
Boots and shoes	76	8.7	1232	9.7
Textiles and Knitting Mills	**22**	**2.5**	**229**	**1.8**
Clothing	**158**	**18.2**	**2613**	**20.6**
Tailors and clothiers	61	7.0	1503	11.8
Dress making and millinery	72	8.3	483	3.8
Furriers, hatters, etc.	15	1.7	290	2.3
Corset factories	2	.2	263	2.1
Wood and Furniture	**94**	**10.8**	**1427**	**11.2**
Sash, door and blind factories	17	2.0	432	3.4
Carpenters and joiners	30	3.4	264	2.1
Cabinet and furniture	16	1.8	354	2.8
Paper Industries	**11**	**1.3**	**199**	**1.6**
Printing and Publishing	**48**	**5.5**	**1716**	**13.5**
Printing offices	32	3.7	1235	9.7
Book binding	6	.7	363	2.8
Primary Metal, Metal Fabricating, Machinery	**110**	**12.6**	**1679**	**13.2**
Foundries and machine working	25	2.9	372	2.9
Fittings... in brass...	25	2.9	263	2.1
Tin and sheet iron working	40	4.6	330	2.6
Agricultural implements	3	.3	322	2.5
Non-Metallic Mineral Products	**17**	**2.0**	**224**	**1.8**
Petroleum, Coal, Chemical Products	**24**	**2.8**	**224**	**1.8**
Transportation Equipment	36	4.1	223	1.8
Carriage making	23	2.6	194	1.5
Miscellaneous Manufacturing Industries	**95**	**10.9**	**1092**	**8.6**
Jewellers and watchmakers	24	2.8	139	1.1
Musical instrument making	9	1.0	270	2.1
Broom and brush making	8	.9	225	1.8
All Others	**61**	**7.0**	**302**	**2.4**
ALL INDUSTRIES	870	100	12708	100

[1]Only industries with more than 20 establishments or more than 200 employees are shown. Residual categories under each Major Industry Group are not shown and therefore industries do not add up to the total of each Major Industry Group.

Source: Census of Canada, 1880-81, Volume III, pp. 323-496.

by employment. For instance, breweries are at the top of the "large" category in terms of capital invested, but just make it into the "medium" category in terms of employment. The divergences between capital invested and employment are the result of great differences in capital-labour ratios. These ratios also vary considerably, but are less skewed than the scale measures. Highly capital intensive industries had averages of $901-$4852 invested per worker, industries with medium capital intensity show values of $501-$900, and the least capital-intensive (or labour-intensive) industries had capital values of $95–$500 per worker. Average yearly wages per worker vary from a low of $131 in "straw works" to a high of $533 in "fire-proof safe making". Industries with medium and high capital intensity generally had higher wage levels and industries with medium to high percentages of female workers generally had medium to low wage levels. There are, however, several exceptions to these rules. For example, in "stone and marble cutting", which was conducted in small-scale establishments with a fairly low capital-labour ratio ($513 per worker), the exclusively male labour force enjoyed the third highest wage rate of the 42 industries analysed. Undoubtedly, the periodic or maybe even perennial shortage of highly skilled stone masons in Toronto pushed wage rates up.

Not included in Table 2 are figures for the use of power and nothing there indicates mechanization or the division of labour. Kealey shows many examples of the increasing division of labour as Toronto's manufacturing expanded strongly from the 1850s onward[33] and there is certainly a great deal of anecdotal evidence in descriptions of Toronto factories in the early 1880s. Agricultural implements factories, printing and bookbinding establishments, corset factories, shoe factories and manufacturies, musical instrument-making establishments

Table 2 Criteria for Delimiting Organizational Types of Industrial Production, Toronto, 1881

Scale I: Capital Invested

Average amount of capital invested in $ per establishment, based on Ontario capital-labour ratio x average of employment size of Toronto establishments

Category	Capital Invested in $	No. of industries
Very large	96,000 – 274,000	3
Large	20,000 – 63,000	11
Medium	9,900 – 17,000	10
Small	778 – 8,000	18

Median of 42 industries: $ 11,000; average of 42 industries: $26,122

Scale II: Employment

Average number of workers per establishment

Category	Number of workers	No. of industries
Large	43 – 132	9
Medium	19 – 39	12
Small	2 – 17	21

Median of 42 industries: 18 workers; average of 42 industries: 28.2 workers.

Capital – Labour Ratio

Amount of capital invested per worker (Ontario data)

Category	$ per worker	No. of industries
High capital intensity	901 – 485	10
Medium capital intensity	501 – 900	16
Low capital intensity	95 – 500	16

Median of 42 industries: $ 602/worker; average of 42 industries: $887/worker.

Wage Rates

Average yearly wage in $

Category	Wage in $	No. of industries
High	351 – 533	12
Medium	250 – 350	19
Low	131 – 232	11

Median of 42 industries: $293; average of 42 industries: $301

Female Labour

Females "over" and "under 16 years"

Category	% Female workers	No. of industries
High	60 – 97	9
Medium	44 – 57	2
Low	1 – 33	15
None	0	16

Source: Census of Canada, 1880-81, Volume III, pp. 323-496, and pp. 508-519.

and many others were organized on the basis of departments, indicating, together with the many specialized jobs which appeared, an increasing division of labour.[34] The description of the Newcombe piano factory included a comment about organization of production in the mid-1880s: "Their factory is conducted on the principle of a division of labour, the work passing through many hands before it is completed..."[35] Yet, in spite of the division of labour, Newcombe, like several other piano makers, did not employ motive power to run machines and tools. Unfortunately, there is no systematic data on the use of steam engines in 1881. Census data for 1871 has been used by Kealey and the Bloomfields to show the "combined and uneven" development of production at that time.[36] Most smaller and medium-size establishments did not have steam engines, and in some industries, especially clothing and shoe making, even large and very large establishments were manufactories rather than factories.[37] The 1880 "fire insurance plan" and many descriptions of individual plants in the "booster literature" of the 1880s indicate that the pattern prevailing in 1871 may also have been applicable in the early 1880s.[38]

The result of grouping 42 industries into organizational types is displayed in Table 3. Since a full list of all 42 industries would occupy too much space, only three "exemplary" industries of each type are shown. The description based on census "variables" is complemented by less systematic data from a variety of sources. At both ends of the spectrum are types of organization one would expect: manufacturing industries with large-scale, capital-intensive plants (Type I) on the one hand and industries with small-scale, labour-intensive shops (Type VII) on the other hand. Type I includes the two flagships of Toronto's manufacturing strength at the time: the massive Gooderham and Worts distillery and Massey's equally large agricultural implements factory. The other industries belonging to Type I are all from the food, metals-machinery and chemical groups, such as breweries, fire-proof safe making, engine building, and soap and candle making. Sprawling plants with intricate arrangements of highly specialized buildings were equipped with powerful steam engines or pairs of steam engines delivering up to 200 horsepower (HP) output. Four of the industries in this group paid high wages (the other two were in the medium wage category) and only one of these industries (soap and candle making) employed women. The industries at the other end of the spectrum (Type VII) are low-wage activities with high to very high percentages of female employees. Two of these are clearly small scale (dressmaking and millinery; shirt, collar and tie making), but the other two, namely paper box making and tailors, would fit in at the bottom of the medium-scale industries as far as employment is concerned. Because of the small amount of capital invested, however, they rank definitely as small scale. In the Laurie/Schmitz and Bloomfield typologies, they would rank as "sweatshops" and "larger craftshops" and some individual establishments in the "mechant tailor" branch definitely were "smaller" and "larger" manufactories. The other two industries were closer to the "artisans' craftshops."

Between these two extremes are five other distinct forms of organization. There are four industries which have been classified here as small and medium scale, but highly capital intensive (Type II). In many ways they are similar to the large-scale industries (usually high wages, absence of female employment, use of steam power), but they are also remarkable because they point out that capital intensity is not necessarily bound up with large factories. The industries captured here are, like the large scale ones, from the food, metals-machinery and chemical groups. Types III and IV are industries with medium- to large-scale plants but, unlike Types I and II, are characterised by medium and low capital intensity. Type III includes a diversity of industries such as printing, bookbinding, iron smelting, sash door and blind factories, straw works, furriers and hatters, and musical-instrument making. Wage levels and female employment vary considerably from industry to industry, as does the application of power. For instance, there is little evidence of the use of steam engines in the hat and fur industry, but steam power was used widely in printing and book binding and in almost all of the sash, door and blind factories, otherwise known as planing mills. The industries belonging to Type IV are generally in the medium- to large-scale category because of the size of employment in the establishments. We find here a mixture of "smaller" and "larger manufactories" and "smaller factories". Wages in three of these industries are low and in the other two at the lower end of the medium scale; females are always present, and in the case of two industries, the percentages are high. Types V and VI are characterised by small-scale establishments. There is little evidence that, in the industries of medium capital intensity, power tools were used, although establishment size did vary. The industries of Type VI (low capital intensity) were even less likely to employ steam power. Generally, these industries fit into the "artisans' shop" or "craftshop" type. Wages in 13 of the 15 industries were at the medium level and only in stone and marble cutting were they high and in the tin and sheet iron working industry low.

Many of the industries found in Toronto in the early 1880s may have had a homogeneous organization, but in some industries, particularly in printing, engraving and lithographing, and tin and sheet iron

Table 3
Selected Industries by Type of Organization, Toronto, 1881[1]

Organization Type and Exemplary Industries	Scale		Capital-Labour Ratio	Average Yearly Wage	Percent Female Workers
	Capital-Invested	Employment			
Type I	Very large and large scale		High capital intensity	High and medium wages	None or low %
Distilleries	274,138	56.5	4852	404	0
Agricultural implements	120,927	107.3	1127	443	0
Soap and candle making	41,450	21.3	1946	320	12
Type II	Medium and small scale		High capital intensity	High and medium wages	None or medium %
Meat curing	21,204	12.4	1710	338	0
Foundries, etc.	14,647	14.9	983	384	0
Patent medicine	9,914	8.1	1224	413	44
Type III	Large and medium scale		Medium capital intensity	Variable wages	Variable %
Book binding	36,542	60.5	604	255	64
Printing offices	30,455	38.6	789	371	9
Musical instr. mkg.	20,130	30.0	671	475	0
Type IV	Large and medium scale		Low capital intensity	Medium and low wages	Variable but always present
Corset factories	12,492	131.5	95	139	91
Tobacco working	14,090	30.3	465	214	23
Cabinet, furniture	9,923	22.1	449	307	4

(cont'd)

works, a strong gradation existed from very small workshops to large-scale establishments with more than 100 workers. At least in the printing industry, scale and the application of steam power seem to have been strongly related. While most of the small workshops seem to have lacked steam engines, the mid-size establishments with 20-50 employees seem to have had engines with 3-15 HP output, and large printing "factories", like the *Mail* and the *Globe* newspapers, with 100-200 employees, had 50 and 40 HP available each.[39] Still other industries were characterized by "uneven" development. In cabinet and furniture making, for instance, a distinct bi-polar size structure existed in the early 1880s. On the one hand, there were about 10-15 small-scale workshops and manufactories; on the other hand there was the Robert Hay furniture company, employing several hundred workers in a highly departmentalized factory with a 120 HP engine complex.[40] Two industries or groups of industries stood out because of a very intricate organizational structure. In boot and shoe making, five different types of establishments can be discerned on the basis of data from the 1871 Census.[41] First, there were two large boot and shoe "factories", which employed 510 and 191 workers respectively. Then there were six large "manufactories", employing between 50 and 192 workers (but without the use of steam power). In a third class were two small "manufactories" (30 and 49 employees respectively) and in a fourth class were nine "large workshops" with 6-12 shoemakers each, most likely producing custom-made shoes and boots. The fifth and final class consisted of 21 small shoemakers' shops. In the early 1880s, similar organizational differences seem to have existed. There is reasonable evidence that, in 1882, three large "factories" and two or three large "manufactories" existed side by side. There also seem to have existed medium-size and smaller establishments produc-

Table 3 (cont'd)

Type V	Small scale		Medium capital intensity	Variable wages	Medium, low and none
Bakeries	5,292	8.4	630	277	23
Engraving, lithogr.	7,941	11.8	673	390	6
Fittings..in brass...	7,896	10.9	752	330	0
Type VI	**Small scale**		**Low capital intensity**	**Medium wages**	**low and none**
Boots and shoes	6,059	16.2	374	280	25
Carriage making	3,948	8.4	472	278	1
Cooperage	1,604	5.4	297	347	0
Type VII	**Small scale**		**Low capital intensity**	**Low wage**	**High %**
Paper box making	6,662	20.5	325	131	67
Tailors, clothiers	7,724	24.6	314	232	63
Dress making, millinery, etc.	1,454	6.7	217	144	97

[1] Based on an analysis of 42 industries. For explanation of criteria see Table 2.
Additional industries by organization type:
Type I: Fire-proof safe manufactories; breweries; engine building.
Type II : Oil refineries.
Type III: Straw works; furriers, hatters, etc. ; iron smelting; sash, door, blind factories.
Type IV: Hosiery manufactories; trunk, box making; broom, brush making.
Type V: Wool cloth making; jewellers, watch makers; carving, gilding; dyeing, scouring; tin, sheet iron works; stone, marble cutting.
Type VI: Saddle, harness making; boat building; carpenters, joiners.
Type VII: Shirt, collar, tie making.

Source: see Table 2.

ing custom made boots and shoes, and there is also evidence of many "cobblers".[42] The 1881 census makes it possible to distinguish five industries within the clothing industries group. Two of these industries, tailors and clothiers with 61 establishments and dressmakers and milliners with 72 establishments, had a large and heterogeneous organizational structure. Again, with the help of the 1871 census, one can distinguish between clothing manufactories operated in conjunction with wholesaling, large production units operated in conjunction with dry-goods retailing, merchant tailor workshops with typically 6-25 workers, and many small dressmaking shops. In the early 1880s, a similar grouping is recognizable and, according to Hiebert, it was well visible in 1891.[43]

The diversity of organizational types includes the extremes of the large-scale, capital-intensive and small-scale, labour-intensive industrial activities discussed by Scott. As will be shown, in Toronto of the early 1880s, the location trends of these industries conformed to Scott's observation of the twentieth-century metropolis: centrally-located small-scale labour-intensive industries and peripherally-located large-scale capital-intensive industries. The location patterns of the other industries is neither predicted by the Scott account nor by the "mainstream" model. The latter would suggest, of course, that all manufacturing activity, perhaps with the exception of facilities requiring very large sites, should be expected in the "city centre". This, however, was not the case in Toronto.

The Location of Manufacturing within Toronto

The political territory of the City of Toronto between the mid-nineteenth century and the early 1880s was not large by international standards (see Fig. 1). It stretched over 6.4 kilometres from Dufferin Street in the west to the Don River in the east and along a south-north distance of 3.3 kilometres from the harbour to Bloor Street. The city developed on a relatively level plain. Several creeks flowed from north to south, and as the built fabric expanded, these creeks were gradually converted into sewers and their ravines filled in. There is no evidence of waterpower having been used along these creeks or along the Don River within the City's boundaries. Between 1851 and 1881, considerable urban development took place both within the terrain of the built-up area of 1851 and outside of it. Fig. 1 shows that in 1881 the extent of the political territory of the city and the built-up area largely coincided. However, building coverage was far from even. The edge of the built-up area was very frayed and there were

many sub-areas within this "envelope" which contained substantial amounts of vacant land. For instance, large parcels of land were available south of Front Street, including the central sections of the waterfront, largely because of new sites being created through landfill. By 1881, a central business district (CBD) with several sub-areas (retail axes, wholesale district, and office nucleus) had appeared and a zone around the central business district (here referred to as central area fringe or CAF) had emerged with complexes and clusters of high order public functions and with a transportation—storage belt along the waterfront. Also of note are the commercial axes, which extended outward from the CBD to the north, west and east. Lined up along these were many high and low order retail and service establishments as well as other land uses.[44] Although a number of manufactories and factories existed before 1851, Toronto's "industrial revolution" occurred predominantly within the urban growth pattern of the 1851 to 1881 period. Indeed, factories, manufactories and craftshops were active elements in the evolving built fabric and land-use pattern of the city. In several areas, factories were the leading edge of development.

Putting Toronto's manufacturing establishments of the early 1880s on the map is not a straightforward task. Since information on an establishment basis cannot be extracted from the 1881 census, only the city directories provide a systematic account of manufacturing locations. In this study, the *Toronto City Directory for 1883 was used*, which reflects the existence of manufacturing establishments in 1882. Although it is a year away from the 1881 Census, it was deemed more advantageous than the *Toronto City Directory for 1882* because of its broader range of information.[45] Several difficulties arise when using the city directory. First of all, the nomenclatures of the census and the directory quite often diverge. Both sources use distilleries or breweries as labels, but the city directory has a multitude of different metal and machinery producers which hardly overlap with those used by the census takers. Another and more vexing problem is that the city directory often lists products, but does not indicate at what stage of the economic process the respective establishment takes part. In other words, "safes" as a heading in the "business" section of the city directory does not indicate whether the establishment listed is involved in manufacturing, wholesaling, or retailing—or in a combination of these! It can also be very misleading to take the location provided in the "business" section or even in the "alphabetical" section of the city directory as the location of a manufacturing establishment. The purpose of the directory was to guide the purchaser to where the manufacturer was selling the goods rather than where they were produced. Surprisingly, many manufacturers whose plants or "works" were located outside the CBD had showrooms and/or retail outlets on King or Yonge Streets within the CBD. For instance, furniture manufacturers Jacques and Hay (later Hay and Co.) kept a showroom on King Street when they moved their production facility to the southern edge of the central area. Similarly, piano manufacturers Mason and Risch kept a retail outlet in the CBD when they established a large factory at King West and Bathurst. Other Toronto manufacturers had small offices in the CBD. Still other companies from Montreal or from several U.S. cities only had retail outlets (e.g. the U.S. based Gutta Percha and Rubber Co.) or sales offices, and/or warehouses in Toronto's CBD. Again, in most cases, the dual locations are not indicated in the "business directory" and very often not even in the alphabetical section. Only additional sources, such as the "street" section of the city directory, the 1880 fire insurance plan and the 1884 city atlas, contemporary descriptions of the city, as well as company histories, can help to avoid the pitfalls of seriously overrepresenting the city centre in the geography of early 1880s manufacturing.

About 150 headings from the "business directory" were initially used to compile lists of manufacturing establishments. Close to 20 headings, especially related to tobacco, jewellery making and tinsmithing were deleted, because the headings and other material made it impossible to distinguish producers of goods from retailers or providers of services. The other 130 headings were reduced to 63 industries, largely by eliminating overlaps and aggregating very similar types of activities. The locations of these 63 industries were mapped and summarized by using four concentric zones (see Fig. 1). These zones are: the Central Business District (CBD) with a radius of about 400 metres around King and Yonge, the central area fringe (CAF), with an outer radius of about 600 metres, the inner ring (IR) with an outer radius of about 1.8 kilometres, and the outer ring (OR) with an outer radius of about three kilometres.[46]

A synopsis of the location patterns of the different organization types is provided in Table 4, which reveals a rich texture. At the extremes of the organizational spectrum, large-scale, capital-intensive industries and small-scale labour-intensive industries show location patterns predicted by Scott's argument about twentieth-century location dynamics: the former were found in non-central and the latter in central locations. However, as far as the small-scale, labour-intensive industries and the clothing and shoe industries are concerned, some important qualifications have to be made. In addition, each of the other organizational types, lying between the two extremes, includes industries with quite different location patterns. A more detailed discus-

sion of location patterns in relation to scale, capital intensity and other important aspects related to location follows.

Figure 1 shows that half of the 26 establishments of the large-scale, highly capital-intensive industries (Type I) were located in the outer ring area of Toronto in the early 1880s, another ten in the inner ring area, and only three were in fairly central locations (in the central area fringe, but not in the CBD). Quite a number of these factories were relatively new, either having been relocated from other places to Toronto (like the Massey agricultural implements factory from Newcastle in 1879) or from the more central parts of Toronto to the periphery (like the Morse Soap Co. or the Gartshore Car Wheel Co.). Others were established at the urban fringe in the period between 1830 and 1870 (like the Gooderham and Worts distillery and most of the breweries) and in many cases, urban development had gradually engulfed them by the early 1880s. Although these industries and their establishments had scale and capital-intensive production in common, they were a heterogeneous assembly in other respects. Some, like Gooderham and Worts and Massey, were large in terms of capital invested, labour employed, and site occupied. Employing between 125 and 400 workers they ranked amongst the city's largest employers. They occupied sites of four to seven acres (1.5 to 2.5 hectares) and these sites were equipped with sets of specialized buildings and large power plants. Both the distillery and the agricultural implements factory fit into the picture of highly-integrated production processes and massive, standardized inputs and outputs.[47] Other factories, like the breweries and soap works, were large in terms of capital invested and site, but relatively small in terms of employment. Typically, in the breweries, about 20 men worked on sites of about an acre (0.4 hectares), and these sites were also

Table 4 Summary of Location Patterns: Organization Types and Sub-Areas, Toronto, 1882

Organization Types and Industries	Number of Establishments				
	CBD	CAF[1]	Inner Ring	Outer Ring	All Areas
Type I: Large-Scale, High Capital Intensity					
Soap manufacturers			1	2	3
Distilleries, breweries, maltsters			4	7	11
Engine builders, etc.[2]		3	5	4	12
Type II: Medium and Small Scale, High Capital Intensity					
Glue manufacturers, tanners				2	2
Meat packing and other foods[3]	1		2	1	4
Oil refineries			2		2
Iron, stove founders, etc.[4]		10	6	1	17
Machinery manufacturers, etc.[5]	6	9	9	3	27
Drugs, paints, varnish, etc.[6]	10	2	3	2	17
Flour, feed mills		4			4
Billiard table manufacturers		1			1
Coffee mills, vinegar mnfrs.	4	4	1		9
Scale factories	1	2			3
Type III: Large and Medium-Scale, Medium Capital Intensity					
Straw works		1		1	2
Planing mills, etc.[7]		8	11	5	24
Musical instrument making	2	5	4	1	12
Printers	37	1	3	1	42
Hats, caps and furs	10	1			11
Bookbinders	10				10
Type IV: Large and Medium-*Scale, Low Capital Intensity*					
Trunk (leather) manufacturers			1		1
Broom and brush making	1	2	3	4	10
Cabinet, furniture making	2	6	9	2	19
Knitting mills	1		2		3
Corset factories		2			2
Type V: Small-Scale, Medium Capital Intensity					
Stone and marble cutting[8]	3	1	8	1	13
Carvers and gilders	4	5	3	1	13
Brass founders and finishers	3	7		3	13
Engravers, lithographers[9]	18				18

(continued)

Table 4 cont'd

Type VI/VII: Small-Scale, Low Capital Intensity					
Carriage, wagon makers	2	9	11	5	27
Coopers	1	5	2	5	13
Saddle, harness makers	9	5	9	1	24
Paper bag manufacturers	4	2	1		7
Footwear and Clothing Industries					
Boots and Shoes (unspecified)	9	14	18	12	53
Upper manufacturers	3				3
Boots and shoes (large manufactories and factories)	6				6
Dressmakers	10	23	71	24	128
Tailors	13	7	15	2	37
"Merchant tailors"/tailors[10]	6	6	10		22
Merchant tailors	24	3	12		39
Shirt, overall manufacturers[11]	5	1			6
Large manufacturers[12]	11	2			13

1 Central Area Fringe, see Fig. 1.
2 Includes agricultural implement manufacturers, fire-proof safe manufacturers, and miscellaneous metal fabricators such as bridge builders, car wheel manufacturers, and chain makers.
3 Includes grape sugar refiners and starch factories.
4 Includes iron founders, stove manufacturers, and file, saw and edge tool manufacturers.
5 Includes various machinery manufacturers (mill machinery, printing presses, gas engines, elevator manufacturers, steam pump manufacturers) and machinists.
6 Includes various "chemical works", ink, blueing and blacking manufacturers.
7 Includes sash, door and blind, wooden box, and coffin manufacturers.
8 Includes picture frame and mirror manufacturers.
9 Includes electrotypers
10 Firms which are listed as "merchant tailors" in the "business directory" but which are not describing themselves as merchant tailors in the "alphabetical" section of the Toronto Directory 1883. They seem to be smaller than the merchant tailors proper, but of more substance than the "tailors".
11 Part of wholesale firms.
12 Part of wholesale or retail firms.

Source: *Toronto City Directory,* 1883 and Tables 2 and 3.

equipped with steam engines, all kinds of machinery, and a range of highly-specialized buildings, such as ice houses, malting floors and storage cellars (see Fig. 2).[48] Still other establishments, especially in the engine building and other metals industry category, were large in terms of capital invested and labour, but quite small in terms of site occupied. The extreme case here is the Taylor "fire-proof safe" factory, which employed about 125 men on a site of less than half an acre (about 1,700 square metres). The Taylor establishment was also one of the three centrally-located ones!

In spite of the large volumes of inputs and outputs, the locations of these establishments were not always well served by transportation facilities. Only the distillery had its own waterside loading facilities, and the distillery and four other establishments had their own rail sidings. (Two other factories occupied lots adjacent to water and rail, but there is no evidence of sidings or docking facilities.) Most factories must have relied on horse-drawn wagons to a considerable extent. Grain and coal especially must have been hauled in large quantities from docks and railway yards to breweries, while by-products from brewing and distilling were carried away by wagon loads.[49] Some of the burden of transport was bearable because of short distances between interconnected production places. For instance, in the south-eastern part of the city, the by-products from distilling (and maybe those of nearby breweries) were fed to cattle. These and pigs were slaughtered in the area, and the by-products from meat packing became the raw materials for nearby soap factories, tanneries, and leather works.[50]

Accessibility for labour may have been a problem at times, especially for large companies like Massey, who were new to Toronto and expanded fast. Some preliminary investigations of the location of workers shows that Massey employees lived largely within one kilometre of the plant in 1882. However, a large proportion of these workers were boarders, indicating a sudden influx and a considerable housing problem.[51] In the case of more established factories, labour seems to have been more dispersed, and in the case of the centrally-located Doty engine works, no worker lived closer than one kilometre to the factory. In this case, the workers lived all over the city with the exception of the streets of the wealthy.[52] All industries of Type I paid high or at least medium wages and, with the exception of soap works, women were not employed. The burden of long journeys to work seems to have been bearable.

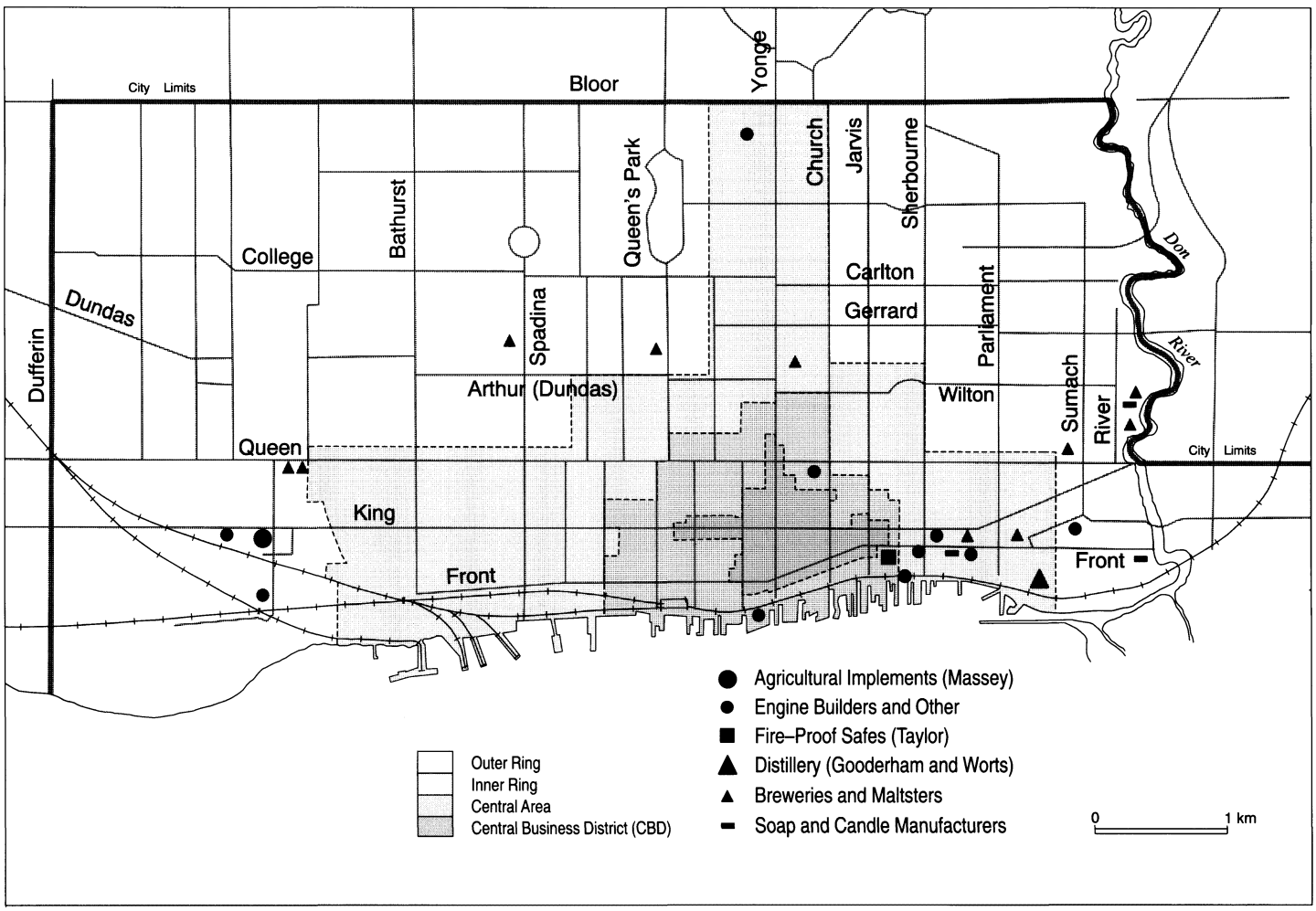

Figure 1: Large-Scale, Capital Intensive Industries (Type I), 1882

The medium- and small-scale, capital-intensive industries (organization Type II) were associated with three quite distinct location patterns (see Fig. 3). Glue manufacturers, tanners, meat packers, and oil refineries were almost exclusively found in non-central locations. They shared many characteristics with the large-scale, capital-intensive industries and, as discussed above, were often linked to these in terms of inputs or outputs. A second group of medium- and small-scale, capital-intensive industries were predominantly found in central locations. Flour mills and a billiard table manufacturer had locations in the central area fringe, but drug, varnish and paint manufacturers, coffee and spice mills, vinegar manufacturers, and scale manufactures were found in both CBD and central area fringe as well as in a few locations further out. Although a few of these were accommodated in special purpose buildings (esp. flour mills), the others were mostly found as tenants in general-purpose commercial buildings. Obviously, their small size in terms of employment and space requirements made them locationally flexible. Since general-purpose commercial space was widely available across the city, it can be hypothesized that the central locations may have been attractive because of input and/or output linkages, with centrally-located wholesale and retail establishments forming strong points of attraction. A third group of the medium- and small-scale, capital-intensive industries were located in both central and non-central districts, although CBD locations were infrequent. These industries were iron and stove foundries and various kinds of machinery manufacturers (printing presses, elevators, mill machinery, pumps) and machinists' workshops. Generally, they

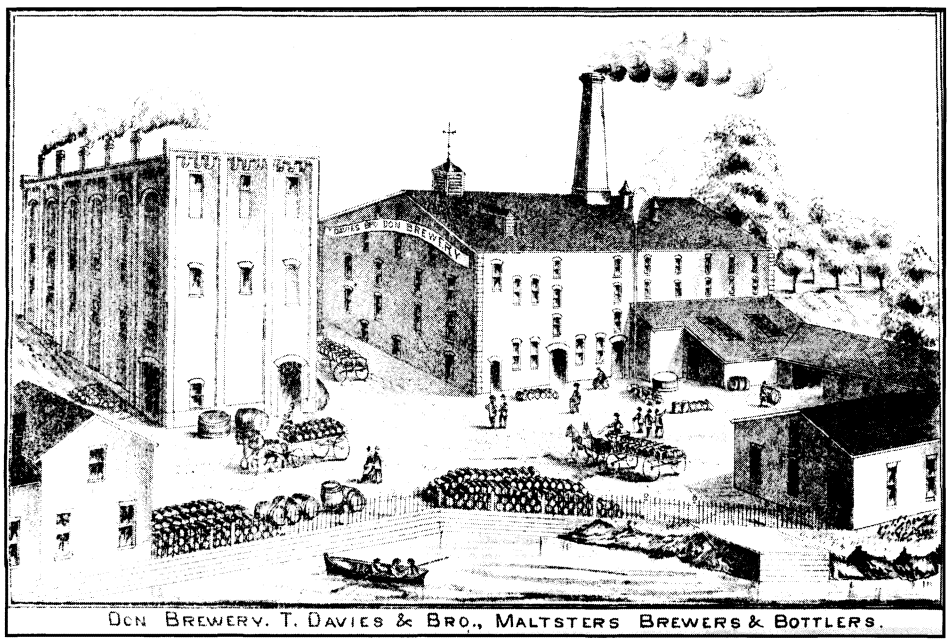

Figure 2: ***Don Brewery, Queen Street East, River Street and Don River. Drawing published in 1877 (Timperlake,*** **Illustrated Toronto,** ***270; courtesy Metropolitan Toronto Reference Library)***

were small in terms of work force (about 15 workers on average), employed only males, paid high wages, and they were usually equipped with steam engines. Little is known about their input and output linkages, but judging from the presence of retail outlets of several of the stove manufacturers in the CBD, one could conclude that local markets must have been important. On the other hand, Greey's mill machinery factory must have found the local market extremely narrow and the evidence of their equipment in many Ontario grist and flour mills suggests these products were shipped out from Toronto by railway.[53] Plant size in terms of employment, capital invested and lot size seems to have varied strongly. Two extreme examples are Beckett's Globe Foundry and the Gurney stove foundry. The Globe Foundry was accommodated at the rear of a mid-nineteenth-century standard row building on Queen Street West in the central area fringe (see Fig. 4). It shared a 3,900 square feet lot with a retail store and the residential quarters of the foundry owner's family; it employed between 8 and 20 workers and was equipped with a nine horsepower engine. Gurney's, on the other hand, occupied a building complex especially constructed in 1871 on a "greenfield" site on King Street just west of Spadina (see Fig. 5). About 150 workers were employed on the 65,000 square feet (1.5 acres or .6 hectares) site and a steam engine provided between 25 and 65 HP.[54] Plants like Gurney's, however, could also be found in the central area. They were usually much older than Gurney's and, unlike some, had not moved in spite of increasing congestion and increasing land values.

The large- and medium-scale types of industries with either medium or low capital-intensity (organization Types III and IV) also display remarkably divergent location patterns. Again, highly-concentrated, relatively evenly-distributed, and non-central distribution patterns existed side by side, in spite of considerable homogeneity in organizational characteristics. This is best illustrated by printers and planing mills (including sash, door and blind factories, and wooden box and coffin factories): both of these industries were in the medium capital intensity and high-wage categories; female labour was completely or relatively unimportant; they were similar in average employment size (38.6 employees per establishment for printers, 25.4 for planing mills); and most printers and all planing mills were equipped with steam engines. These two industries were located far from each other: printers were highly "centralized", being prominent even along the main retail axes of the CBD, and planing mills were strongly dispersed (see Fig. 6). Differences in productivity per unit of land, linkages, and social standing must have accounted for the divergent location patterns. Planing mills used fairly large sites to deal with bulky materials. Thus, productivity per unit of land was probably low. The destinations of the output was probably households, firms and construction sites dispersed throughout the city and no advantage was gained by competing for central sites. Since inputs were bulky, it could be expected that they would be mostly found along rail lines and/or the water's edge. This is not the case, however, and it must be concluded that horse-drawn vehicles provided the necessary tranportation medium. Printers, on the other hand, either technically could manage with a small amount of space and/or because of central location choices, were forced to do so. Here, up to 100 or 150 people worked in multi-storey printing plants, or four or five printers worked in small establishments above shops or in office buildings. All the larger printers had steam engines with up to 50 HP installed by 1880 and some of the firms with 15-25 workers seem to have run anything upward from 3-5 HP engines.[55] The most

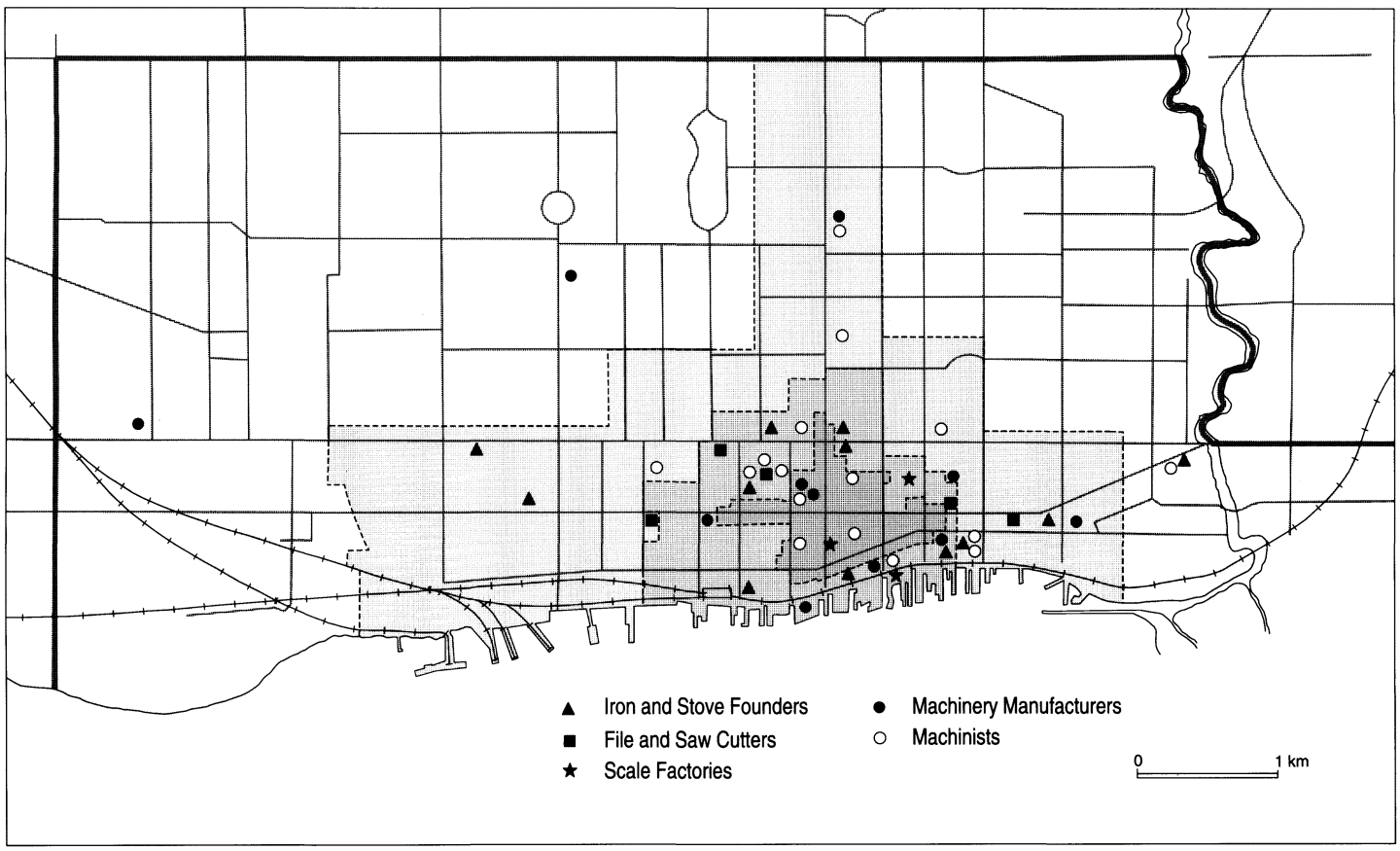

Figure 3: Selected Medium and Small-Scale, Capital Intensive Industries (Type II), 1882

important location factors for printers were undoubtedly linkages. First, the big newspapers were part of a power nexus at the city centre, linking trade, finance, justice and politics. Some descriptions of the editorial offices reveal the social status that publishers and printers demanded.[56] There were many input and output linkages conducted in a small area too: news gathering, inputs from specialized firms like engravers and bookbinders, market or output linkages to centrally located purchasers like law firms, financial businesses, wholesalers and the larger retail merchants.[57] A large, fairly well-paid (and well-organized) labour force could be drawn from all over the city.[58]

Two other interesting large- and medium-scale medium and low capital-intensive industries were musical-instrument makers and cabinet and furniture makers. Piano making, which seems to have flourished after the introduction of tariffs on imports in 1878, was still relatively strongly concentrated in the central area in the early 1880s. However, as a rapidly-expanding industry, it was in a state of flux and this included strong spatial mobility. The earlier firms like Heintzman, S.R. Williams, and Mason and Risch were all located in the CBD, occupying general purpose commercial buildings, but, around 1880, had started an exodus. By 1882, Mason and Risch and Williams had moved their production facilities out of the CBD to inner ring locations, leaving behind retail/showroom establishments in prominent places within the CBD. Later in the 1880s, the Newcombe company moved from the central area fringe to a large multi-storey factory in the western part of the City of Toronto, while Heintzman was lured to the municipality of West Toronto Junction by bonuses.[59] An exceptional plant, which probably ended up in the large- and medium-scale, low capital-intensity category (Type IV) only because the many small cabinet makers dragged down the average establishment size for the industry, was the Robert Hay furniture factory. Initially established at King and Bay, it

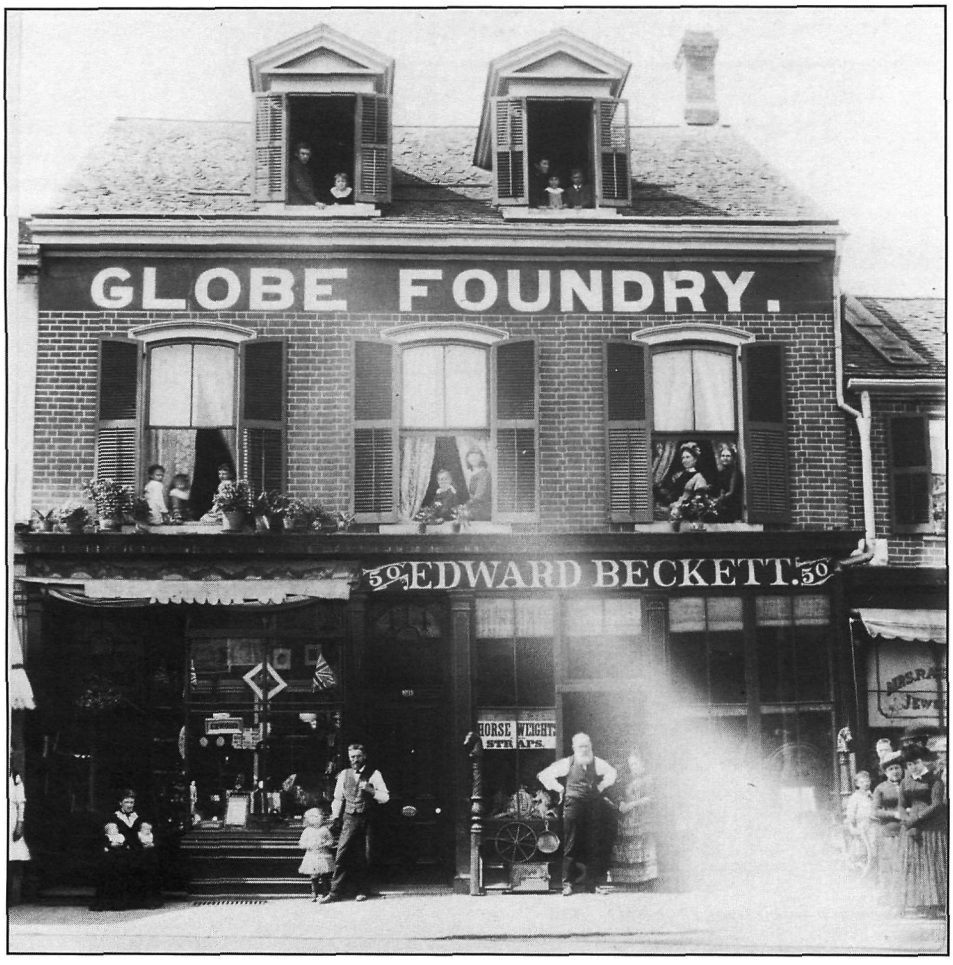

Figure 4: Edward Beckett's Globe Foundry (workshop at rear) 50 Queen Street West at Bay, about 1882 (Metropolitan Toronto Reference Library T31585)

moved to Front and Yonge in the 1840s and to a landfill site on the central waterfront in 1853, the latter move coinciding with the arrival of the first railway service along the waterfront. In 1880/81, Hay employed about 200 or 300 workers on a huge site, which included steam engines with a total capacity of 120 HP, one of the largest in the city. There is a good deal of evidence that the lumber inputs arrived by rail rather than by boat, since the company had established a lumber mill and parts plant about 150 kilometres north of Toronto.[60]

Types V, VI and VII include industries with small-scale establishments and either medium or low capital inputs. According to Scott's rationale, these should all be found in central locations and, to a large extent, the Toronto establishments were conforming to that expectation. However, there are also strongly visible departures. Carriage and wagon making (see Fig. 6), stone and marble cutting, and cooperage had a minor presence in the CBD, and a somewhat stronger one in the central area fringe; the majority of the establishments were, however, located in the inner ring area.

Two other industry groups (clothing, boots and shoes) were initially grouped with other industries of the small-scale type. As pointed out before, very substantial differences within these industries requires their separate treatment. The juxtaposition of very large production units with 100 and up to 400 or 500 workers on the one hand and very small units with one or up to five persons makes averages meaningless. Manuscript census data on individual establishments in 1871 allows for grouping according to size and mechanization (use of steam power). The results are mapped and shown in Figures 7 and 8. The text, however, discusses the patterns in the early 1880s, largely reconstructed with a variety of evidence, albeit less systematic than the 1871 census data.[61] Location patterns are opposite to what might be expected: the large, more capital-intensive types of establishments were only found in the CBD, while the smallest and least capital-intensive establishments, those of dressmakers, were truly dispersed throughout the city. Mass production of both clothing and footwear seems to have occurred in very large factories and manufactories in the wholesale district. Although there is not much evidence of a vertical division of labour across different sub-industries, the wholesale and adjacent retail district provided very good conditions for the acquisition of material and service inputs (various wholesale merchants, agents, and banks providing leather, textiles, services for sewing machines, financial services) and facilities to market the products (other wholesalers, the city's major retailers, transport services). Whether these factories actually assembled a large work force every day in the wholesale or retail districts or sent work out to home workers in the early 1880s is not known. Probably both occurred. The merchant tailors, who sold ready-to-wear, semi-customized men's clothing were establishments with usually 15 or more tailors, and

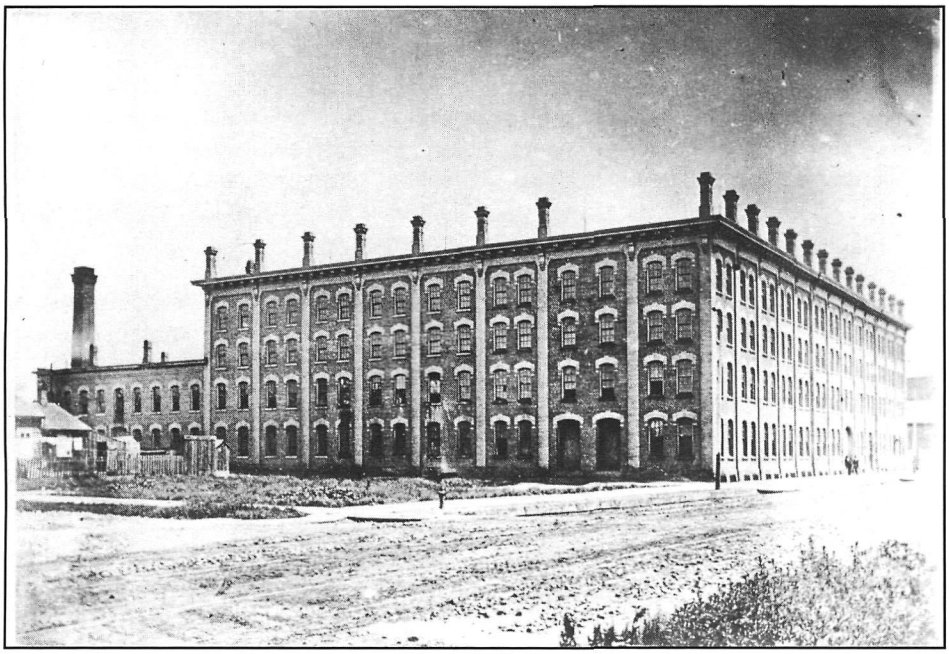

Figure 5: ***Gurney Stove Foundry, King Street West between Spadina and Brant, late 1870s or early 1880s (Metropolitan Toronto Reference Library T10879)***

by the mid-1880s the largest of them, Jamieson, employed 150 workers.[62] All prominent merchant tailors were located on King and Yonge Streets in the CBD and the central area fringe, and there were a dozen others, exclusively located along the commercial axes outside the central area. Obviously, access to individual consumers made these large craftshops hybrids between production and high-order retail establishments. Several of the city's large dry-goods retailers combined selling goods across the counter with clothing production. Whether these clothes were mass-produced or semi-customized and whether they were both men's and women's clothes is not known. There is some evidence, however, that between 100 and 200 women or "girls" were employed by several of the city's largest retailers in cramped quarters above the retail floors at least on a seasonal basis.[63] Smaller tailor shops, boot and shoe makers, and dress makers were scattered along the commercial axes and even through most of the neighbourhoods of Toronto. According to Hiebert, these tailors and dress makers engaged in custom work, keeping close to what was presumably a less mobile part of the population.[64]

The investigation of location patterns by organization type does not lead to simple generalizations. Only large-scale, capital-intensive manufacturing establishments show a clear location trend in terms of central versus non-central location. In the case of all other organization types, individual industries differed considerably if not very strongly from each other in terms of location patterns. Neither scale nor capital intensity by themselves were sufficient location determinants. It appears that, within each organization type, industries differed in terms of the bulk of materials used, location of inputs, social and spatial configuration of markets, labour requirements, infrastructure requirements, and maybe social acceptability.

These conclusions are also confirmed when a slightly different perspective is adopted. Instead of taking organization type as the starting point, it is instructive to start with location tendency. In Table 5, industries are ordered by prevalent location in terms of centrality and non-centrality. In the middle of Table 5 is a special category for "balanced" location patterns, i.e. industries which did not show a clear trend to either central or non-central locations. Only a few industries were strongly concentrated in the CBD. Printing and related activities and the larger establishments of the clothing industry, as well as those of the boot and shoe industry, were overwhelmingly CBD-oriented. While the industries strongly represented here did not include any highly capital-intensive ones, some variation in capital intensity is noticeable. The presence of large-scale factories in terms of employment is particularly apparent. As Table 6 shows, 23 of the 46 large employers in the manufacturing sector were found in the CBD in the 1880s, but only 6 percent of the 100 largest establishments when the size of the site is considered.[65] There were different segments of labour employed here too: males with high wages in the printing industry worked across the street from poorly-paid young women in the clothing industry. All industries employed at least some women. Linkages within the CBD were most likely very important, although not primarily in the form of a division of labour across stages in the production process, but rather, as indicated earlier, between manufacturers on the one hand and wholesalers and retailers on the other. Interaction patterns within the printing industry were complemented by linkages between printers and a wide range of economic and political entities centrally located in the city.

Some industries were primarily or exclusively located in the central area fringe, while some of them also had a presence in the CBD. Average establishment size in these industries was generally medium and small scale, especially in terms of employment. Corset factories were an exception. Although both corset factories were located in the central area fringe, at least one of them was just across the street from CBD clothing industry factories of equal size, labour intensiveness, low-wage jobs and a high percentage of female workers. The flour and feed mills, all in the central area fringe, were exceptional cases. The other industries differed remarkably from each other, but in all cases the relatively small scale made them adaptable to the various forms of buildings in either main street or off-main street locations.

The industries which were found both in central and non-central locations are also quite varied in character. Industries whose plants were on average of small and medium scale were both represented, but large-scale production was not associated with this kind of location pattern. Only straw works were of large scale, but there were only two and one of them was in the central area. This latter factory produced straw hats and shared

Table 5 Industries by Concentric Zones, Toronto, 1882

A) CBD - Based Manufacturing (> 60% in CBD)

	Establishments		Scale[1]		Capital/	Wages1	%
	Total	% in CBD	Capital	Employ -ment	Labour Ratio[1]		Females[1]
Printers	42	88	L	M	Med.	High	Low
Bookbinders	10	100	L	L	Med.	Med.	High
Engravers, lithographers	18	100	S	S	Med.	High	Low
Boots, shoes (manufactories, factories)	6	100	N.A.	(L)[2]	(Low)[2]	N.A.	(Low)[2]
Clothing manufacturers	13	85	N.A.	(L)[2]	(Low)[2]	(Low)[2]	(High)[2]
Merchant tailors	39	62	N.A.	(M)[2]	(Low)[2]	(Med)[2]	(Med)[2]
Shirt, overall manufacturers	6	83	N.A.	(M)[2]	(Low)[2]	(Low)[2]	(High)[2]
Hats, caps and furs	11	91	M	M	Med.	Low	High

B) Central Area - Based Manufacturing (> 60% together in CBD and Central Area Fringe)

	Establishments		Scale		Capital/	Wages	%
	Total	% in CA	Capital	Employ -ment	Labour Ratio		Females
Flour, feed mills	4	100	L	S	High	High	0
Scale factories	3	100	L	M	High	Med.	0
Corset factories	2	100	M	L	Low	Low	High
Billiard table manufacturers	1	100	M	S	High	High	0
Coffee mills, vinegar mnfrs.	9	89	M	S	High	High	0
Paper bag manufacturers	7	86	S	M	Low	Low	High
Brass founders, finishers	13	77	S	S	Med.	Med.	0
Drugs, paints, varnish, etc.	17	71	S	S	High	High	Low
Carvers and gilders	13	69	S	S	High	Med.	Low

(continued)

Table 5 (cont'd)

C) Balance between Central Area and Rest of City (40–60% in Central Area)

	Establishments		Scale		Capital/	Wages	%
	Total	% in CA	Capital	Employ -ment	Labour Ratio		Females
Iron, stove founders, etc.	17	59	M	S	High	High	0
Musical instrument making	12	58	M	M	Med.	High	0
Saddle, harness makers	24	58	S	S	Low	Med.	Low
Machinery manufacturers,	27	56	M	S	High	High	0
Tailors	37	54	S	S	Low	Low	Low
Straw works	2	50	L	L	Med.	Low	High
Coopers	13	46	S	S	Low	Med.	0
Boots and shoes (unspec.)	54	43	S	S	Low	Low	Low
Cabinet, furniture making	19	42	M	M	Low	Med.	Low

D) Non-Central Manufacturing (% in Central Area)

	Establishments		Scale		Capital/	Wages	%
	Total	% in CA	Capital	Employ -ment	Labour Ratio		Females
Carriage, wagon makers	27	37	S	S	Med.	High	0
Stone, marble cutting	13	31	S	S	Low	Med.	
Knitting mills	3	33	L	L	Low	Med.	
Planing mills, etc.	24	33	M	M	Med.	High	0
Broom, brush making	10	30	M	M	Low	Low	
Dressmakers		26	S	S	Low	Low	
Meat packing, etc.	4	25	L	S	High	Med.	0
Engine builders, etc.	12	25	L	L	High	High	0
Trunk (leather) mnfrs.	1	0	L	L	Low	Low	
Soap manufacturers	3	0	L	M	High	Med.	
Distilleries, breweries, etc.	11	0	L	M	High	High	0
Glue manufacturers, tanners	2	0	L	M	High	Low	0
Oil refineries	2	0	L	S	High	High	0

1 For definitions see Table 2.

2 See notes 41 and 43.

Source: *Toronto City Directory*, 1883 and Tables 2 and 3.

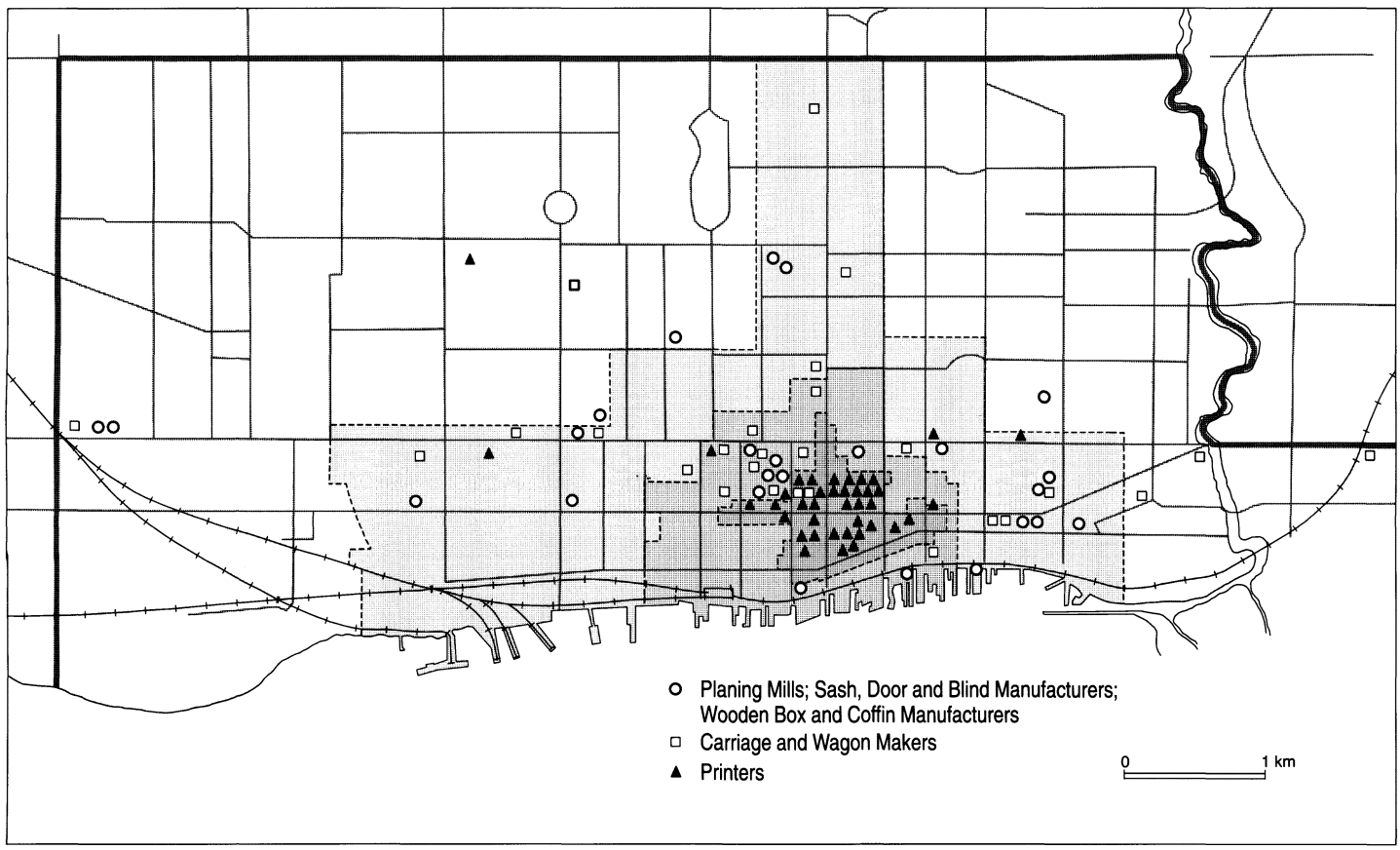

Figure 6: Planing Mills, Carriage Makers, Printers, 1882

Table 6 Spatial Distribution of Large Scale Manufacturing Establishments, Toronto, Early 1880s

Establishment Scale		Locations CBD	Central Area Fringe	Non-Central	All
Employment	n	23	5	18	46
(establishments ≥ 100 workers)	%	50.0	10.9	39.1	100.0
Sites	n	6	36	58	100
(≥ 3,000 square feet/ 279 m^2)	%	6.0	36.0	58.0	100.0
3,000-29,999 sq.ft.	n		30	36	72
30,000-89,999 sq.ft.	n		5	12	17
90,000 sq.ft.	n		1	10	11

Sources: see note 65.

many characteristics with the corset factories and large clothing producers. Straw works were also the only industry out of nine with a high percentage of female workers.

Non-central industries also included a range of organization types. There were the many dress makers along the commercial axes and scattered throughout the neighbourhoods, and there were the workshops of stone cutters and carriage makers. Otherwise, there were industries which do stand out because of large-scale and/or high capital intensity. In contrast to the CBD, the non-central areas contained a large proportion of the large plants when the size of sites is considered (see Table 6). However, only 39 per-

Figure 7: Boot and Shoe Production in the Central Area, 1871

cent of the large-scale employers in manufacturing were found in the non-central areas and also in contrast to the CBD, female labour was generally not prominent.

In the non-central parts of the city, manufacturing activity was not distributed evenly. There were concentrations along the commercial axes, and there were isolated plants or small clusters, especially in the north-western districts of the city. Workshops and factories, as well as grocery stores, were noticeably absent from the wealthier residential areas in the north-eastern sector of Toronto. Industrial sectors (in spatial form) began to emerge very clearly by the early 1880s. One stretched from the eastern edge of the CBD along the Front Street axis to the Don River and beyond. Workshops and factories of various sizes were scattered and clumped along the waterfront, along Front, King and Queen Streets, and along many of the minor streets. Metal, food and wood industries were prominent, and special clusters, like the functionally interdependent agglomeration of distilling, meat packing, soap making, and leather producing firms near the mouth of the Don River, were clearly in place by the early 1880s. Another spatial sector began to emerge along the King Street axis to the west of the central area. Here metal and wood industries occupied more and more sites along King Street and by the early 1880s the beginnings of the western and north-western industrial sectors of the early twentieth century found a start with the Massey, Inglis and Hunter, and Toronto Bridge works, all of which belonged to the large-scale, capital-intensive engineering industries.

Appraisal

Although a relatively small city by international standards, Toronto possessed a varied industrial structure by the 1880s, and the variety of its manufacturing activities was associated with a whole range of location patterns. As in other cities, and especially larger ones, manufacturing was not confined to the "centre", "core" or some other construct of centrality. On the contrary, similar to patterns in other cities, a central agglomeration, which included labour-intensive industries, was found in juxtaposition to large-scale capital-intensive industries in non-central locations, a contrast which Scott sees as a twentieth-century phenomenon. Apart from the early occurrence of "decentralized" industries, there are other deviations from the model proposed by Scott, such as the large employers engaged in mass production in the city centre, the small but capital-intensive establishments in central locations, and the variety of medium- and small-scale, labour-intensive production units in the non-central parts of the city. Scale, measured only by total capital invested and capital intensity, was not strongly associated with central or non-central location patterns in Toronto of the early 1880s. This does not mean, however, that the location pattern of manufacturing was chaotic. The diversity of

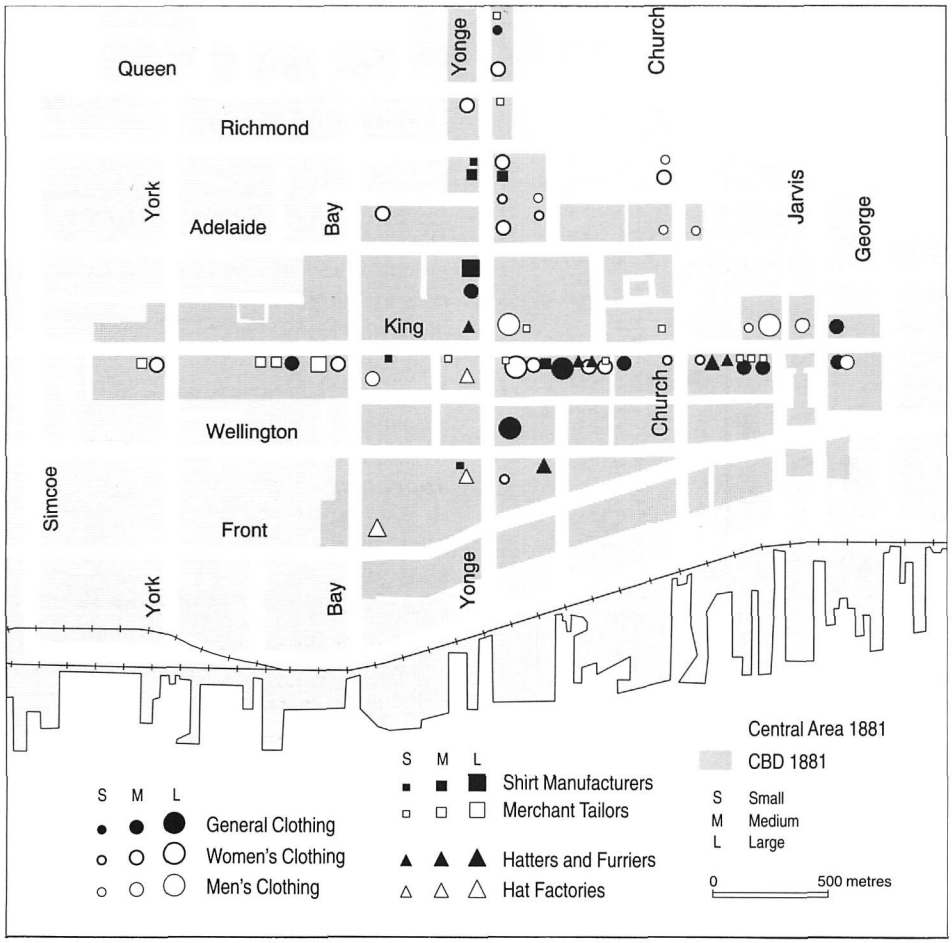

Figure 8: Clothing Production in the Central Area, 1871

location patterns makes more sense when one considers a variety of input and output linkages not exclusively predicated on scale and capital intensity. Also (and this has not been systematically investigated here) the intensity of production per unit of land may have put limits on the ability to pay high central area land prices.

Where some see order, others see irregularities. Indeed, the establishments of many industries appeared in such different locations that one could question any rationale for location strategies. Some of the reasons for these seemingly indeterminate patterns were undoubtedly spatial adjustment processes at the time (as in the piano making industry). But this does not mean that eventually equilibrium would be restored through relocations. Some plants had grown so large and/or involved investment in such enormous amounts of immobile capital that cataclysmic events were needed to dislodge them (especially the distilling, brewing, and agricultural implement industries).[66] Others may have adjusted by non-spatial strategies, such as increasing capital inputs or increasing low-wage labour inputs. Still others may have been content to go out of business slowly in situ.[67] There is a lot of work still to be done on the locational dynamics of nineteenth-century manufacturing in Toronto and elsewhere.

There are other issues which surface here, especially related to transportation and the mobility of goods and labour. By the 1870s and 80s water-borne traffic and water-transport-related manufacturing locations probably had decreased in importance. The reason why factories located on the waterfront was more likely to be the presence of the railway and the availability of fairly cheap land.[68] Even in the early 1880s the area south of Front Street was still a development frontier, especially because of the creation of sites through landfill. As the city expanded, locations in proximity to the rail corridor became more and more frequent for manufacturers, gradually resulting in linear industrial districts stretching inland. To what extent factories near railways actually used these transportation facilities remains unknown.[69] An educated guess is that the transport of goods by horse-drawn vehicles was extremely important. If commodities had to be transported between different locations both near and far from railways, labour had to be transported as well. Consideration of the complex patterns of industrial location warns us about the validity of any gross generalizations concerning the links between home and work. It appears that both high-wage and low-wage labour employed in the central area was fairly dispersed throughout the city (e.g. printers and workers in boot and shoe factories). Investigation of the residential patterns of workers in peripherally-located factories revealed that a large proportion of the workers come from the proximate side of the city. However, the spread around these factories varied considerably and was probably linked to the length of time a plant was established and the specific characteristics of its labour demands. There were

few or almost no factories where the workers' homes huddled in front of the plant gate. Our notions of the journey-to-work in the "pedestrian city" may require a more careful look.[70]

The rich variety of locations implies that the owners of factories and workshops were making location choices (or deciding to stay in place) in the time before and after 1881/2. These choices were considered along with those relating to scale of operations, capital and labour inputs, sources of inputs, markets and transportation modes and routes. While they needed to make choices in the face of existing conditions, they were also purposely or inadvertently changing these conditions.[71] Not much is known about how Toronto manufacturers influenced conditions so that different production spaces would arise within the city. However, what is likely is that manufacturers were on the defensive side. Toronto was a city with a complex social and economic structure; it was not an industrial city. Retail and wholesale businesses, offices of various kinds, and various institutions made claims on land in the growing city. The absence of manufacturing in the elite areas of the city (along Jarvis and Sherbourne north of Queen and the Beverley-St. George-Queen's Park area) and many other residential areas suggests a high degree of social control of manufacturing activities.[72] As the commercial and professional middle classes expanded, the screw on manufacturing tightened. There is not much left of it now.[73]

Acknowledgment

I would like to thank Grant McGill, Erin Sills and Lesley Yule for research assistance. Their help was made available through an SSHRC General Research Grant administered by the Department of Geography, University of Toronto. Thanks also to Dan Hiebert and Robert Lewis, who commented intensively on a draft, and Jane Davie of the University of Toronto, Department of Geography, Cartography Office, who designed the maps.

Notes

1. *History of Toronto and County of York.* Volume II (Toronto: C. Blackett Robinson, Publisher, 1885), 108-109. B. Dyster, "Francis Henry Medcalf" in *Dictionary of Canadian Biography*, Volume X (Toronto: University of Toronto Press, 1972) 503-504.

2. For a pertinent critique of technological determinism in interpreting industrial location see R.A. Walker, "Technological determination and determinism: industrial growth and location" in M. Castells (ed.), *High Technology, Space and Society* (Beverly Hills: Sage, 1985), 226-264, esp. 246; see also A. Sayer, "Industry and Space: a sympathetic critique of radical research", *Environment and Planning D: Society and Space*, 3, (1985), 3-19, esp. 25.

3. Especially A.J. Scott, "Locational Patterns and dynamics of industrial activity in the modern metropolis", *Urban Studies*, 19, (1982), 111-142; also "Commodity production and the dynamics of land-use differentiation", *Urban Studies*, 16, (1979), 95-104.

4. E.K. Muller and P.A. Groves, "The emergence of industrial districts in mid-nineteenth century Baltimore", *Geographical Review*, 69, (1979), 159-178; R.D. Lewis, "The development of an early suburban industrial district: the Montreal ward of Saint-Ann, 1851-71" *Urban History Review/Revue d'histoire urbaine*, 19, (1991), 166-180; R.D. Lewis, "Restructuring and the formation of an industrial district in Montreal's East End, 1850-1914", *Journal of Historical Geography*, forthcoming.

5. The "mainstream" construct appears, of course, in numerous publications. The following are only examples, starting with more recent ones: J.E. Vance, *The Continuing City. Urban Morphology and Western Civilization* (Baltimore, London: Johns Hopkins University Press, 1990), 498-499; J.D. Kasarda, "Economic restructuring and America's urban dilemma" in M. Dogan and J.D. Kasarda (eds.), *The Metropolis Era. Volume 1: A World of Giant Cities* (Newbury Park: Sage), 56-84, esp. 59-62; G.A. Tobin, "Suburbanization and the development of motor transportation: transportation technology and the suburbanization process" in B. Schwartz (ed.), *The Changing Face of the Suburbs* (Chicago: University of Chicago Press, 1976), 95-112. 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*, 28 (1972), 49-80; *D. Ward, Cities and Immigrants* (New York: Oxford University Press), 85-87; L.N. Moses and H.F. Williamson, "The location of economic activities in cities" *American Economic Review*, 57, (1976), 211-222, esp. 213; B. Chinitz, "City and suburb" in B. Chinitz (ed.), *City and Suburb. The Economics of Metropolitan growth* (Englewood Cliffs: Prentice-Hall, 1964), 3-50, esp. 24-25. — A slightly different version acknowledges some "decentralization" before 1900, e.g. A. Pred, "The intrametropolitan location of American manufacturing", *Annals of the Association of American Geographers*, 54, (1964), 165-180, esp. 168-169. P.O. Muller, *Contemporary Suburban America* (Englewood Cliffs: Prentice-Hall, 1981), 37 and 135.

6. Scott, "Locational patterns and dynamics...", 111-112.

7. Scott, "Locational patterns and dynamics...", 125.

8. Scott, "Locational patterns and dynamics...", 119.

9. Scott, "Locational patterns and dynamics...", 121.

10. Lewis, "The development of an early suburban industrial district..." and " Restructuring and the formation of an industrial district in Montreal's East End...".

11. Muller and Groves, "The emergence of industrial districts...", 168-176.

12. Fales and Moses, "Land-use theory and the spatial structure of the nineteenth-century city", esp. 58. The reading of Fales and Moses here is quite different from almost any other publication I can think of. Usually Fales and Moses are quoted as evidence that manufacturing was highly centralized in the nineteenth-century city. This, however, is a selective use of Fales and Moses, who make clearly contradictory statements.

13. D. Harvey, *Consciousness and the Urban Experience. Studies in the History of Theory of Capitalist Urbanization.* (Baltimore: Johns Hopkins University Press), 114, based on J. O. Retel, *Elements pour une histoire du peuple de Paris an 19^{e} siècle* (Paris, 1977).

14. J.E. Martin, *Greater London. An Industrial Geography* (London: Bell, 1966), 1-23.

15. Harvey, *Consciousness and the Urban Experience...*, 112-114.

16. Muller and Groves, "The emergence of industrial districts...", 173.

17. Muller and Groves, "The emergence of industrial districts...", 178.

18. Lewis, "The development of an early suburban industrial district...", 166-168.

19. Harvey, *Consciousness and the Urban Experience...*, 63-123, esp. 74, 94-95, 119-121.

20. On London see Martin, *Greater London...*, 21; on Chicago see Muller, *Contemporary Suburban America*, 37; on Toronto see D. Beeby, "Industrial strategy and manufacturing growth in Toronto, 1880-1910", *Ontario History*, 76, (1984), pp. 199-232, esp. 204.

21. The first Toronto manufacturer to construct a major single-floor plant was probably the Northey Pump Co. See Bebee, "Industrial strategy and manufacturing growth in Toronto...", 215.

22. For instance G.D. Garland, *Suburbanization and the Transition to Monopoly Capitalism* (Toronto: University of Toronto, Department of Geography, unpubl. M.A. Thesis); Bebee, "Industrial strategy and manufacturing growth in Toronto...". Both studies document growth of "industrial suburbs" like West Toronto Junction, New Toronto and Swansea from the end of the 1880s onward. At least Garland's work is based on a "political economy" approach, which relies on a politically fragmented metropolis to drive "suburbanization. This approach is forcefully put forward by D.M. Gordon, "Capitalist development and the history of American cities" in W.K. Tabb and L. Sawers (eds.), *Marxism and the Metropolis. New Perspectives in Urban Political Economy* (New York: Oxford University Press, 1978), 25-63, esp. 47-49. I consider this to be only a special case of "decentralization" or the spatial reconfiguration of manufacturing.

23. Apart from the 1880-81 census there is the 1883 Toronto City Directory, complied in 1882. It is much more comprehensive than any directory published before. In 1880 the first "fire insurance plan" for the City of Toronto was published by Charles E. Goad. Since it did not cover the whole developed area of the City, Goad's *1884 Atlas of the City of Toronto* is useful. Several contemporary publications provide interesting snap-shots of many of Toronto's manufacturing firms, although "boosterish" and "auto-biographical" tones recommend some caution: J. Timperlake, *Illustrated Toronto: Past and Present* (Toronto: P.A. Gross, 1877); "Toronto - the Queen City of the West", *Canadian IIIlustrated News*, May 28, 1881 (partially reprinted in C.P. de Volpi, Toronto. *A Pictorial Record* (Montreal: Dev-Sco Publications, 1965), Plate 127; C.P. Mulvaney, *Toronto: Past and Present. A Handbook of the City. (Toronto and the County of York, Ontario, Volume I* (Toronto: C.B. Robinson, 1885); C.C. Taylor, *Toronto "Called Back", from 1888 to 1847* (Toronto: W. Briggs, 1888). There are also a number of company histories and a small body of secondary literature on manufacturing available. See esp. G.S. Kealey, *Toronto Workers Respond to Industrial Capitalism*, 1867-1892 (Toronto: University of Toronto Press, 1980).

24. The term "industry" refers to a class of manufacturing establishments producing reasonably similar products or using similar processes, i.e. a branch of the production system. Individual factories, manufactories (large firms without power-driven machines) or workshops are referred to as "establishments". The industry labels used are predominantly those which appear in the Census of 1881. Industries are aggregated into "Major Groups" in Table 1 according to the scheme developed in G.T. Bloomfield and Elizabeth Bloomfield, *Standard Industrial Classifications Applied to Historical Data*: *The 1871 Industrial Census* (Guelph: University of Guelph, *Canadian Industry in 1871, Research Report 7*, 1989).

25. *Census of Canada, 1880-81.* Volume III, Tables XXIX-LIV, 324-496.

26. *Census of Canada, 1880-81*, Table LVI, 508-519. It is not known how representative the Ontario ratios are of conditions in Toronto.

27. There is not a lot of hard evidence that local commodities formed inputs in local commodity production, except in the case of linkages between distilling, meat processing, soap manufacturing and tanning (see note 50). However, many of the kinds of products made by Toronto factories are mentioned by other manufacturers as inputs.

28. See, for instance, G.S. Kealey, *Toronto Workers*, 20; or *History of Toronto...*, 398 regarding the Planing mill of William Burke, which was driven by a 100 horsepower Corliss Engine built by Inglis and Hunter. It may have been made in Toronto, after Inglis moved here from Guelph around 1879.

29. Individual establishment data from the 1871 Census is available in G.T. Bloomfield and Elizabeth Bloomfield, *York County Industries, 1871. Index to Manuscript Census Including Toronto* (Guelph: University of Guelph, *Canadian Industry in 1871, Ontario County Series #35*) 61-74, 98-109. *The History of Toronto...* includes employment figures for a considerable number of establishments.

30. For instance, according to the *History of Toronto...*, 376, the Massey factory had 400 men employed in 1884 (see also Kealey, *Toronto Workers...*, 317). The *1881 Census*, however, lists only a total of 322 male employees in three Toronto agricultural implements factories. In "cabinet and furniture" the 1881 Census lists 16 establishments and a total of 354 employees. However, all publications that mention the Hay furniture factory talk of a factory with 400 or more workers. Undoubtedly, Toronto went through recessionary times in the later 1870s, but whether employment increased very strongly between 1881, the census year, and 1883 or 1885 is not so certain.

31. 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), 43-93; Bloomfield and Bloomfield, *York County Industries*, 1871..., 32.

32. Scott, "Locational Patterns and dynamics...", 127.

33. Kealey, *Toronto Workers...*, 21-25.

34. See for instance *History of Toronto...*, 405 on "stationers, bookbinders, account book manufacturers" Brown Brothers or 375-376 on the Massey Manufacturing Co. On the latter see also M. Denison, *Harvest Triumphant. The Story of Massey-Harris* (Toronto: Collins, 1949), esp. 78; and Mollie Gillen, *The Masseys. Founding Family* (Toronto: Ryerson Press, 1966), esp. 50. On the Crompton Corset Co. see Mulvaney, Toronto: Past and Present..., 291-292 and Taylor, *Toronto "Called Back"...*, 326.

35. Taylor, *Toronto "Called Back"...*, 291.

36. Kealey, *Toronto Workers...*, 28; Bloomfield and Bloomfield, *York County Industries*, 1871..., 32-35.

37. Of the Toronto clothing establishments in 1871 only two straw hat manufacturers were equipped with steam engines, and only two of 49 boot and shoe making establishments. Bloomfield and Bloomfield, *York County Industries*, 1871..., 64-66.

38. Descriptions of factories published around 1880 (see note 23) rarely mention steam engines being used in clothing and shoe making establishments. In clothing, the Crampton Corset Co. seems to have been an exception. Only three of the six large boot and shoe producers had steam engines installed in 1880 according to Goad's Fire Insurance Plan.

39. Systematic data is taken from Goad's *1880 Fire Insurance Plan.*

40. For descriptions of Robert Hay and Co. see *History of Toronto...*, 385 and especially Ruth Cathcart, *Jacques and Hay. 19th Century Toronto Furniture Makers* (Erin, Ont.: Boston Mills Press,

1986), esp. 13-29. See also Goad's *Fire Insurance Plan for 1880*, Plate 5, where the 120HP steam engine is marked.

41. Based on individual establishment data from *Canadian Industry in 1871* Project (CANIND71), University of Guelph, Ontario 1991.

42. The 1882 picture is derived from the contemporary business descriptions (see note 23), the *Toronto City Directory 1883*, and the *1880 Goad Fire Insurance Plan*.

43. The typology of 1871 clothing firms is derived from individual establishment data using employment, capital/labour ratios, average yearly wages, and percent female employment. Data is from *CANIND71*. The 1881-2 characterization of the structure of Toronto's clothing industry relies on the *Toronto City Directory 1883* and the numerous descriptions in the contemporary accounts (see note 23). It should be mentioned that all of the larger "clothing" producers (with the exception of the merchant tailors) were primarily retailers or wholesalers. In many of the descriptions of retail or wholesale firms the presence of substantial numbers of clothing workers is recorded. For instance, Mulvaney, *Toronto: Past and Present...*, 281 on the clothing and dry-goods retailer Petley and Petley: "on the third floor are the workrooms, where the busy fingers of girls and men are kept busily employed all day long." According to the *History of Toronto...*, 455 Petley and Petley employed 150 "hands" in the tailoring and millinery departments. For a description of the structure of the Toronto clothing industry from 1891 onward see D. Hiebert, "The Toronto clothing industry, 1891", part of R.H. Walder, "The developing industrial heartland, 1871-1891", in L. Gentilcore (ed.), *Historical Atlas of Canada. Volume II* (Toronto: University of Toronto Press, 1993) Plate 48.

44. Many elements of the topography of Toronto appropriate as context for displaying and analyzing manufacturing is provided by G. Gad, Elizabeth Buchanan and D.W. Holdsworth, "Commerce in the core: Toronto, 1881", in Gentilcore (ed.) *Historical Atlas of Canada...*, Plate 50.

45. The publishers of the *1883 Directory* claim that it was more "accurate" and more "comprehensive". It is quite a bit larger than the 1882 Directory and for the first time occupations and names of employers are given for at least some of the householders and boarders living in Toronto and its suburbs.

46. The boundary between the inner and outer ring was determined by the coverage of the 1880 Fire Insurance Plan, since Goad did not waste his time on the thinly developed fringe.

47. For a description of the Gooderham and Worts distillery see Dianne Newell and R. Greenhill, *Survivals. Aspects of Industrial Archaeology in Ontario* (Erin, Ont.: Boston Mills Press), 85-96. For a description of the Massey factory see Denison, *Harvest Triumphant...*, 78; Gillen, *The Masseys...*, 50; *History of Toronto...*, 375-376.

48. Most of Toronto's breweries are described and depicted in Timperlake, *Illustrated Toronto...* and History of Toronto.... Goad's *1880 Fire Insurance Plan* provides detailed plans of four of Toronto's ten brewing and malting establishments of 1882.

49. According to Timperlake, *Illustrated Toronto...*, 271, the Gooderham and Warts distillery fed 2500-3000 cattle next to the distillery but, in addition, 400-500 teams carried waste products away every day to "outside cattle".

50. There is reasonably concrete evidence of some linkages. For instance, Timperlake, *Illustrated Toronto...*, 284 mentions that the Morse Soap Co. acquired lard from the "almost adjoining" [pork] packing house. This was most likely the William Davies establishment. Timperlake's book was published in 1877. In 1879 William Davies moved his pork packing plant from Front Street East near the St. Lawrence Market to Front Street East at the Don River. Since the Morse Soap plant followed to the adjoining site, it can be assumed that Davies continued to supply Morse with lard. For accounts of the locations and operations of the William Davies Co. see J.S.Willis, *This Packing Business* (Toronto: Canada Packers, about 1962), 25-26 and M.J. Bliss, *A Canadian Millionaire* (Toronto: University of Toronto Press, 1978), 34-35.

51 The residential pattern of Massey workers was determined by use of the *1883 Toronto City Directory*. Of 229 owners, clerical workers, skilled workers and labourers who could be traced, about 140 were "boarders". The sudden influx of Massey "families" from Newcastle, where Massey was based before 1879, is mentioned by Gillen, *The Masseys...*, 61.

52, Residential pattern determined by use of *Toronto City Directory 1883*. The place of residence of 28 workers and owners were found.

53. My personal knowledge of dozens of Ontario grist mills suggests that there were at least ten with some or many pieces of Greey equipment in place in the 1980s.

54. On the Globe Foundry see *History of Toronto...*, 385-386 and Goad's *1880 Fire Insurance Plan*, plate 28; for Gurney see Taylor, Toronto "Called Back"..., 256-257. Since the 1880 Fire Insurance Plan did not include the Gurney site, inferences about the size of the steam engine have to be made. The 25HP refers to 1871, see Bloomfield and Bloomfield, York County Industries..., 69; the 65 HP engine is on the 1889 Goad Fire Insurance Plan, plate 61.

55. Data on steam power are from Goad's *1880 Fire Insurance Plan*.

56. For a description of the premises of the *Evening Telegram* see Mulvaney, *Toronto Past and Present...*, 193-194.

57. Many contemporary descriptions mention, generically, banks, law firms, wholesalers, and retailors as customers for account books, various business forms and stationary.

58. The residential pattern of the Globe Printing Co. workers was determined by use of the *Toronto City Directory 1883*. Sixty places of residence were found.

59. The growth of Toronto's piano industry is discussed by Kealey, *Toronto Workers...*, 33. Toronto piano makers are portrayed in W. Kelley, *Downright Upright. A History of the Canadian Piano Industry* (Toronto: Natural Heritage/Natural History Inc., 1991) and in the contemporary business descriptions (see note 23). For Heintzman's move to the West Toronto Junction in 1888-89 see Garland, *Suburbanization and the Transition to Monopoly Capitalism*, 80-81.

60. Cathcart, *Jacques and Hay...*, 11 for the location history and 14-16 on the branch factory at New Lowell (Simcoe County, Ontario).

61. For the structure of the 1871 clothing industry and its character in 1881/2 see note 43.

62. *History of Toronto...*, 507.

63. For evidence on employment figures and the clothing production by retailors and wholesalers see note 43.

64. Hiebert, "The Toronto clothing industry", plate 48, note 43.

65. Employment data (for 1885) is from Kealey, *Toronto Workers...*, 316-318. The extent of sites was established by use of the Goad's *1880 Fire Insurance Plan* and *1884 Atlas of the City of Toronto* in conjunction with the *1882 Toronto City Directory*; see Gad, Buchanan and Holdsworth, "Commerce in the Core: Toronto, 1881".

66. For instance, the brewing industry went through a major restructuring (mergers, concentration) in

the 1950s (see D. Kerr and G. Bloomfield, "The persistence of manufacturing patterns" in D. Kerr and D.W. Holdsworth (eds.). *Historical Atlas of Canada*. Volume III (Toronto: University of Toronto Press, 1990), Plate 51. It was only after the 1960s that the old breweries vanished. The Massey and Gooderham and Worts plants were still in operation in the 1970s.

67. For a discussion of non-spatial adjustments see R. Walker and M. Storper, "Capital and industrial location", Progress in *Human Geography*, 54, (1981), 473-509.

68. For the relative decline of shipments by water and the increasing importance of the railway for manufacturing in Toronto see also J. Lemon, *The Toronto Harbour Plan of 1912: Manufacturing Goals and Economic Realities* (Toronto: Working Papers of the Canadian Waterfront Resource Centre, No. 4, 1990), 18.

69. Concentrations of factories along railways, and the small clusters located in various parts of the city, may have been the outcome of dual factors: the rejection of factories by those attempting to protect residences and residential properties on the one hand and the "voluntary" segregation and clustering by industrial land owners and tenants to ward off encroachment by other than industrial land uses on the other hand.

70. Harvey, *Consciousness and the Urban Experience...*, 122 tells of a worker, who, in the 1860s, left his home on the periphery of Paris at five in the morning and walked four miles (6.4 kilometres) to work every morning. Of course, this is only an anecdote; but who knows how far people walked when they needed work? Whose and what standards are we using?

71. See note 69.

72. The locational dynamics of manufacturing in the second part of the nineteenth century and the differentiated location pattern in the 1880s have to be seen in the context of a land market that exerted pressure on manufacturers. Bebee, "Industrial strategy and manufacturing growth in Toronto...", 214 draws attention to land speculation and the shortage of industrial sites. This is, however, not the complete picture. The Toronto elite influenced municipal rules in order to control the allocation of land, although explicit bans on factories were rarely enacted (see Barbara Sandford, "The political economy of land development in nineteenth century Toronto", *Urban History Revue/Revue d'histoire urbaine*, 16, (1987), 17-33). Although industrialists may have been part of this elite, the commercial and professional interests probably far outweighed any others. Toronto was a city of banks, law firms, wholesale merchants, doctors, engineers, professors, etc. (For a similar assessment compare D.R. Green's analysis of nineteenth-century London: although it was the greatest centre of industrial production in the country, it was not an industrial city. D.R. Green, "The Metropolitan economy: continuity and change, 1800-*1939" in K. Hoggart and D.R. Green (eds.)*, London. A New Metropolitan Geography (London: Edward Arnold, 1991), 8-33, esp. 15.)

73. From 1904 onward zoning by-laws were increasingly used to restrict the spread of factories. See P.W. Moore, "Zoning and planning: the Toronto experience, 1904-1970", in A.F.J. Artibise and G.A. Stelter (eds.), *The Usable Urban Past* (Toronto: Macmillan, 1979), 316-341.