CLASSIFICATION OF CENTRES

IN THE MONTREAL ENVIRONS

AND EASTERN TOWNSHIPS REGIONS.

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CLASSIFICATION OF CENTRES IN THE MONTREAL ENVIRONS AND EASTERN TOWNSHIPS REGIONS.

by

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A Thesis Submitted to the Faculty of
Graduate Studies and Research
In Partial Fulfillment of the Requirements for the
Degree of Master of Arts

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Montreal

August 4, 1966

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PREFACE

I wish to express my sincere gratitude to all those who assisted in the preparation of this Thesis.

Particular acknowledgment ought to be made of the McGill Geography Department, especially of Professor J. Lundgren, for his attention and valuable suggestions.

July 1966.

CHAPTER ONE

INTRODUCTION

1. Purpose of Thesis

This thesis is presented as a tentative attempt to classify the cities, towns and villages of the Montreal Environs and Eastern Townships Regions and in the light of regional planning principles to verify the adequacy of the resulting regional systems.

The classification will be a hierarchical classification based on several arbitrary criteria, namely population size, functions and shopping facilities of the centres and inter-relationships between these three criteria.

All the incorporated places of 1,000 and more inhabitants in the Montreal Environs and Eastern Townships Regions will be analysed accordingly. There are 72 such localities in the Montreal Environs and 38 in the Eastern Townships.

The second objective is to compare the regional systems of urban centres resulting from the classification in both Regions and to see whether they are suited to the actual delimitations of the Regions or whether more balanced Regions could be devised through regional planning.

2. Definition of a classification

A classification, whether logical, biological, botanical or historical, is the grouping of objects into classes on the basis of properties or relationships they have in common. Grouping into classes can be made either on the basis of similarity between objects or on the basis of relationship between connected and different objects.

In the first stage of classification one property which is

possessed in some degree by all the individuals is selected as the basis of the grouping: the differentiating characteristic. If the differentiating characteristic is carefully chosen, then other properties of the individuals will be found to change as the differentiating characteristic changes. Such a property is called an accessory characteristic.

The purpose of any classification is to give order to otherwise unmanageable masses of information, and by naming groups of phenomena to transmit easily information about them and in addition to be able to make inductive generalizations.*

Definition of an urban classification

The same concept can be applied to an urban classification. It is a process of arranging and naming groups of localities according to the characteristics and relationships which they have in common, so as to render the existing systems of cities, towns and villages more comprehensible.

An urban classification must not be taken as an end in itself but rather as a mean of studying and better understanding a region.

Types of urban classification

There are several types of urban classification, but we have retained two which we will define briefly.

The hierarchical classification is the one where localities are grouped according to the level of services which they offer. In England, for example, the following ranks are recognized(1):

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* GRIGG, D., The Logic of Regional Systems, Annals of the Association of American Geographers, Vol. 55, No. 3, Sept. 1965, pp. 465-491.

(1) KEEBLE, L: "Principles and Practice of Town and Country Planning", Estates Gazette Ltd., London, 1959, p. 37.

1. Provincial Capitals (daily newspaper, university, regional government offices, etc.)

2. Local Capitals (county town court house, weekly newspaper, etc.)

3. Fully Fledged Towns (3 or 4 banks, high school, cinema, hospital, etc.)

4. Urban Villages (1 bank, 1 cinema, more than 1 store, etc.)

5. Village or minor rural centres (church, primary school, etc.)

6. Hamlets (a few houses grouped together).

The classical study on the hierarchical pattern of centres was made by W. Christaller(2), whose work was later built upon by Lösch(3), Dickenson(4) and others. The summary of their methods and findings will be given later.

On the basis of the data available, our classification will be a hierarchical one and the different localities will be grouped and then classified according to the level of services which they provide.

A functional classification is one where the urban settlements are grouped according to their dominating economic function.

This type of study can be done in two ways: first by the economic base approach, such as Alexander(5) developed, and second by the functional specialization method, used by Alexandersson(6) and

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(2) Christaller, W: see account in : Ullmann, E. "A Theory of Location for Cities", American Journal of Sociology, No. 46, 1941, pp. 853-64

(3) Lösch, A: "The Economics of Location", translated by W.H. Woglom and W.F. Stolper, New Haven, 1954.

(4) Dickenson, R.E: "City Region and Regionalism", London, 1947.

(5) Alexander, J: "The Basic-Nonbasic Concept of Urban Economic Functions", Economic Geography, No. 30, 1954

(6) Alexandersson, G: "The Industrial Structure of American Cities", University of Nebraska Press, Lincoln, 1956.

Harris[1]. Both approaches are meticulous and time-consuming, and require data which is not available for all categories of centres. Even if the data could be gathered in some way, there is not sufficient functional specialization in the two regions to make this type of study. Apart from a few mining towns (Thetford Mines, Asbestos and Black Lake) and some resort towns (St. Sauveur, Ste. Adele), all the other centres have diversified activities.

So it was decided to disregard this type of approach as a basis for our classification.

3. Review of the literature

> "In keeping with the growth of cities, the field of urban geography has become more important both as an academic discipline as one of the foundations for practical decision-making in governmental, business, and social affairs."(2)

Geographers were first preoccupied with the internal structure of cities; but more and more they are turning their attention to the number, spacing and size of cities. "Explicit recognition of the concept of a "system of cities" has come about only within the last quarter century or so."(3) This is the reason why so many geographic studies now relate to the ranking and grouping of urban settlements. One particular aspect of the problem is the classification of the centres, of which there has been a multitude of studies made.

Mayer and Kohn, as stated above, show the practical side of such studies, but unfortunately, it has been lacking greatly. Indeed, the great majority of studies tend to be more academic than realistic.

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(1) Harris, C.D: "A Functional Classification of Cities in the United States" Geographical Review, 1943.
(2) Mayer, H.M. and Kohn, C.F: "Readings in Urban Geography", University of Chicago Press, 1959, p. 1
(3) Duncan, O.D. et al: "Metropolis and Region", Baltimore, 1960, p. 47.

"...most of the contributors to the literature on functional specialization have noted broad regional groupings of their functional classes and have offered general interpreations of this form of regional differentiation.... Whether the ad hoc rationalization of such vague findings greatly advances the understanding of the location-function nexus may be questioned."(1) Of course, they each offer suggestions and recommendations for practical applications, but only a few really go further than the academic and/or pedagogic aspect, ignoring all geographic assumptions.

a) The Central Place Theory

The co-founders of the central place theory were W. Christaller(2) and A. Lösch(3). Christaller in his 1932 study of the distribution of settlements in central Germany, stated that a certain amount of productive land supports an urban centre. He defines central functions as the services performed purely for the surrounding area, and the central places are then the settlements performing them. So the centre exists because essential services must be performed for the surrounding area.

Christaller says that population alone is not a true measure of the importance of a settlement as a central place. Large mining, industrial, or other specialized-function towns may have a small tributary area and few central functions. The author then proceeds to say that in a highly industrialized area, the central place scheme is generally so distorted by industrial concentration that it could have

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(1) Duncan, O.D. et al: "Metropolis and Region", Baltimore, 1960, p. 35.
(2) Christaller, W: op. cit.
(3) Lösch, A: op. cit.

little significance as an explanation for urban location and distribution, although some features of a central place scheme may be present.

Christaller identifies the following types or ranks of central places:

- the market hamlet
- the township centre
- the county seat
- the district city
- the small state capital
- the provincial head city
- the regional capital city.

There are of course some limitations to such a hierarchical system of central places. First, is the failure of actual conditions to conform with the assumptions of the system as defined by Christaller. And, second, the number and boundaries of the categories in this system are necessarily arbitrary to a greater or lesser degree. This last limitation applies to almost all classifications.

But the central place theory has some value, and applies in some areas. It must be considered as an investigative hypothesis and a useful tool for comparative analysis.

Lösch came about with a system of town locations based on the geometry of economic regions as functions of distance, mass production and competition. Even though his assumptions are artificial and very simplified, they can form ideal types of great variety and complexity. Lösch's ideal economic landscape includes "simple market regions surrounding every centre of consumption or production; for every group of products, a net of these market regions; and, finally, a

systematic arrangement of these various nets."(1) What characterizes Lösch's scheme is the hierarchy of central places at the nodes or focal points of the nets and systems of nets, with these places showing gradation by size and differentiation of functions. In addition to the complexity of the central place itself, there are the disturbances caused by topography, uneven distribution of resources and other facots. But there is no extensive region of urban settlements where resources are evenly distributed and topographic variations are absent. So the one way to consider Lösch's approach is to search for regions of relative uniformity in relevant conditions and see whether the central place hierarchy is approximately realized within them.

In the last decade or so, there has been a variety of innovations, in the central-place theory amongst others, most facilitated by the rapid development in computer technology. To mention just a few, Berry(2), Teitz(3), Nystuen and Dacey (4) have developed intricate methods to arrive at central-place models. These authors all used complicated mathematical and statistical processes.

Berry devised a central-place model based on a mathematical method. Using types of functions to identify and classify central places, he then proceeded to make structural equations and factor analysis to assess the "centrality" of central places. Berry states that cities can be considered as systems (i.e. entitles comprising interacting and interdependent parts) and that sets of cities

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(1) Duncan, et al, Op. Cit. p. 25

(2) Berry, B.J.L., Cities as Systems within Systems of Cities, Papers of the Regional Science Association, Vol.13,1964,pp.147-163.

(3) Teitz, M.B., Regional Theory and Regional Models, Papers and Proceedings of the Regional Science Association, Vol. 9, 1962, pp. 35-50.

(4) Nystuen, J.D., Dacey, M.F., A Graph Theory Interpretation of Nodal Regions, Papers and Proceedings of the Regional Science Association, Vol. 7, 1961, pp. 29-42.

constitute systems.

Teitz created regional models of central places based on Lösch's market network.

Nystuen and Dacey with the use of linear graph analysis, divided sets of cities into subgroups which specify a central place and its subordinate hierarchy.

But valuable as it is, the central-place model is only one tool for the understanding of a system of cities and the urban hierarchy would not necessarily be a central-place hierarchy.

b) Examples of urban classification studies.

The central-place theory generated a series of studies on the classification of urban settlements. This interest developed in many countries and it is difficult to trace all the contributors to this field of urban geography. A few examples were selected, originating from different countries to illustrate the work that was accomplished in recent years, the difference and sometimes the similarity of approaches and conclusions.

The industrial structure of cities appeals to geographers because it seems to lead to a better understanding of the location and growth of urban localities. The first city classifications, based on the industrial structure and using statistical criteria were published in 1943 by Chauncy D. Harris in the United States, and by W. William-Olsson in Sweden.

Harris[1] classified the American cities of 10,000 and more inhabitants by a quantitative method of functional analysis. In

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(1) Harris, C.D: op. cit.

determining the principal activities in each city, with the aid of the occupation and employment figures, and then compiling their relative importance in percentages, he arrived at eight groups of cities:

1. Manufacturing cities (of two intensities)
2. Retail centres
3. Diversified cities
4. Wholesale centres
5. Transportation centres
6. Mining towns
7. University towns
8. Resort and retirement towns.

Harris' sources of data were varied,in addition to the population census and the censuses of manufacturing and business, he also used other types of information (for example, a ratio of enrollment in Colleges to the population of the city).

William-Olsson's(1) study on the industries of Northern Sweden was based on a unique statistical source, the 1935 census of population. By taking the percentage of persons employed in six main groups of industries, he classified the towns into three main groups and sub-groups:

1. Cities and trade centres
2. Manufacturing towns
   a) mining and metal industry towns
   b) forest industry towns
   c) other manufacturing towns
3. Railway towns

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(1) William-Olsson, W: Utredning Angaende Norrlands Näringsliv, 1943.

The author studied all Swedish settlements of 200 and more inhabitants.

Nelson's study[1] was also based on a uniform statistical source, the 1950 census of population. The author himself states that his study is perhaps more useful as a reference tool than as an end in itself. He classified all the American cities of 10,000 and more inhabitants, according to the standard deviation from the mean. From the nine categories of services, he took the percentage of labour force engaged in each and classified the cities accordingly.

In 1956, G. Alexandersson[2] also used the functional specialization approach to classify American cities. He was the first to make a distinction between city-serving and city-forming ratios. Before the classification was made, he deducted the city-serving structure from the total structure.

Nelson and Alexandersson are only two of the authors who have sought to identify what is distinctive in the economic structure of a city in comparison with other cities. But their work is representative since in all functional specialization studies, detailed criteria by which cities are grouped into categories are complex; these criteria vary from one study to another and consequently there are variations in the results. This brings us to say then that a classification of cities according to functional differentiation should be instrumental to some theoretically relevant problem.

Another method to classify urban centres was used by Brian J.L. Berry and William L. Garrison[3] in their work on the smaller

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(1) Nelson, H.J: A Service Classification of American Cities, Economic Geography, July, 1955.
(2) Alexandersson, G: op. cit.
(3) Berry, B.J.L. and Garrison, W.L: The Functional Bases of the Central Place Hierarchy, Economic Geography, xxlv, April 1958, pp. 145-54.

settlements in Snohomish County, Washington. The first purpose of the study was to produce "evidence of a system of classes (hereafter termed the hierarchical class-system)"[1]. Many authors expressed doubts as to whether a hierarchy of urban settlements did exist in other than arbitrary form. So Berry and Garrison devised statistical criteria for generating categories with certain optimum properties. But there is some arbitration there too; the decision to accept a particular set of such criteria is itself an arbitrary one.

In Canada, two studies on urban classification need to be mentioned. The first, by Louis Trotier[2] is based on Alexander's basic-nonbasic concept. The author states that the establishment of a classification is arbitrary, that there are no obvious classes. He emphasizes by saying:

> "... there are no such things are hierarchies of financial centers or retail trade centers, or total service centers in this urban network, but only a continuum of centers, so that no types can be set up."[3]

Another Canadian example is the study by Peter Woroby of service centres in southwest Saskatchewan[4]. The pattern of centres devised is based on a classification of service diversity, that is the different kinds of services available in each centre. It is then a hierarchical classification. After having tabulated and analysed

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(1) Berry, B.J.L. and Garrison, W.L., Op.Cit. p. 145
(2) Trotier, Louis: Some Functional Characteristics of the Main Service Centers of the Province of Quebec, Mélanges Géographiques offerts à Raoul Blanchard, Québec 1953, pp. 243-259.
(3) Trotier, Louis, Op.Cit., pp. 253-254.
(4) Woroby, Peter: Service Centres, Royal Commission on Agriculture and Rural Life, Report No. 12, Government of Saskatchewan, Regina 1957.

the services found in the settlements, the author determined a range of services which was then divided into five class intervals. The results of the study are somewhat particular to the region, because they apply to a very specific area, mostly rural, where urbanization has not yet penetrated intensively. The uniform topography of the terrain renders Christaller's theory possible. A striking characteristic of this report is its practical purpose, that is concern for "the related problems of regional administration and co-ordination of government services"(1). This report was part of a Royal Commission on Agriculture and Rural Life in Saskatchewan. The Commission was appointed to investigate and make recommendations regarding the requirements for the maintenance of a sound farm economy and the improvement of social conditions and amenities in rural Saskatchewan. When the nature of the service centre and its tributary area is understood and applied to shifting rural relationship, it provides an effective guide for establishing an orderly and stable pattern of rural service and rural life in the future.

England's contribution to the classification of urban localities has been notable. We cannot retrace all the work which was done, but we have chosen two studies which illustrate two periods and two different approaches. The first, by A. Smailes(2) can be considered as a pioneering effort, and the study by C.A. Moser and W. Scott (3) is a more recent and more sophisticated paper.

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(1) Woroby, Peter: Service Centres, Royal Commission on Agriculture and Rural Life, Report No. 12, Government of Saskatchewan, Regina, 1957, p. 139.

(2) Smailes, Arthur E: The Urban Hierarchy in England and Wales, Geography, No. 29, 1944.

(3) Moser, C.A. and Scott, W: British Towns, a Statistical Study of their Social and Economic Differences, Centre for Urban Studies, Report No. 2, London 1951.

Smailes set forth a very complex scheme describing the conditions in pre-World War II England and Wales. His classification is divided into 9 categories of centres and some subcategories. The differences between the different categories rely on statistical indicators and the presence or absence of certain types of activities. Like any empirical hierarchic classification, Smailes has weak and partial orderings, and the divisions between levels are rarely distinct. "Any grading ... must in some measure be arbitrary, since the urban scale is as continuous as the social scale. Yet the indefiniteness of boundaries in neither case warrants denial of the reality of a stratification."(1)

Moser and Scott's study is more complex and uses modern tools, such as computing machines, for the classification of British urban settlements. The main theme of the study was to unravel the relationships between a great number of urban characteristics, and measure them precisely, rather than to study in detail any simple feature. The two main objectives were, first to assemble and collate material, pointing out the similarities and contrasts, and secondly to classify towns on the basis of their social, economic and demographic characteristics. All towns in England and Wales with populations, in 1951, of 50,000 or more were covered, while the local authority areas were used as units of analysis. The authors were then restricted to statistics classifiable according to local authority areas, such as:

- population size and structure
- population change
- households and housing

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(1) Smailes, A.E., Op. Cit. p. 41

- economic character
- social class
- voting
- health
- education

Various sources of data had to be utilized so as to cover all the information required. A multivariate technique known as component analysis was used to arrive at a systematic pattern for all, or groups of towns. The classification groups together towns possessing roughly the same component score, into three major classes with a total of 14 categories.

The distinction between the latter process of classification and one which makes use of simpler methods, such as dividing towns according to their main industry, is that it takes into account a much wider set of characteristics and that the criteria of classification emerged from the analysis itself(1). The study, however, does not go further than the academic aspect of the classification, it does not give any practical and realistic suggestions for planning or any other use.

A multitude of studies were made in other countries, such as France, Germany, Sweden and most recently, Greece. The process of giving accounts of all these papers would take too much space and time. Moreover, we have covered the most important contribution to the field and the latter were mentioned only in terms of reference.

Various aspects of the works stated above will appear later on in this study as part of more detailed analysis.

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(1) Moser, C.A. and Scott, W: Op.Cit. p. 18.

CHAPTER TWO

PRELIMINARIES

1. Definition of the Two Regions (Map 1)

Economic regions for the whole of Canada were evaluated after the Second World War to cope with the problems of following and understanding developments in various parts of Canada(1). These regions were supposed to be areas of structural homogeneity according to such factors as soil characteristics, production and marketing possibilities, commercial and industrial potential. However, the problems of defining regions and assembling exact data made it necessary for the boundaries of the regions to be drawn along county and census division boundaries, and the resulting regions and zones thus have somewhat arbitrary limits, particularly in the Province of Québec, where the counties north of the St. Lawrence River are excessively elongated towards the north west.

More recently, Camu(2) has made a new classification of the regions of Canada, based strongly on economic considerations. He points out that whilst there must be a theoretical concept underlying it, the first condition for all economic zoning must be utility and on this basis has worked out a system which he says should represent "the best possible combinations of structural, functional, production and market factors allowing for the availability of statistics"(3). It is therefore proposed to adopt these regions for the purposes of the present study, particularly as they coincide exactly with the

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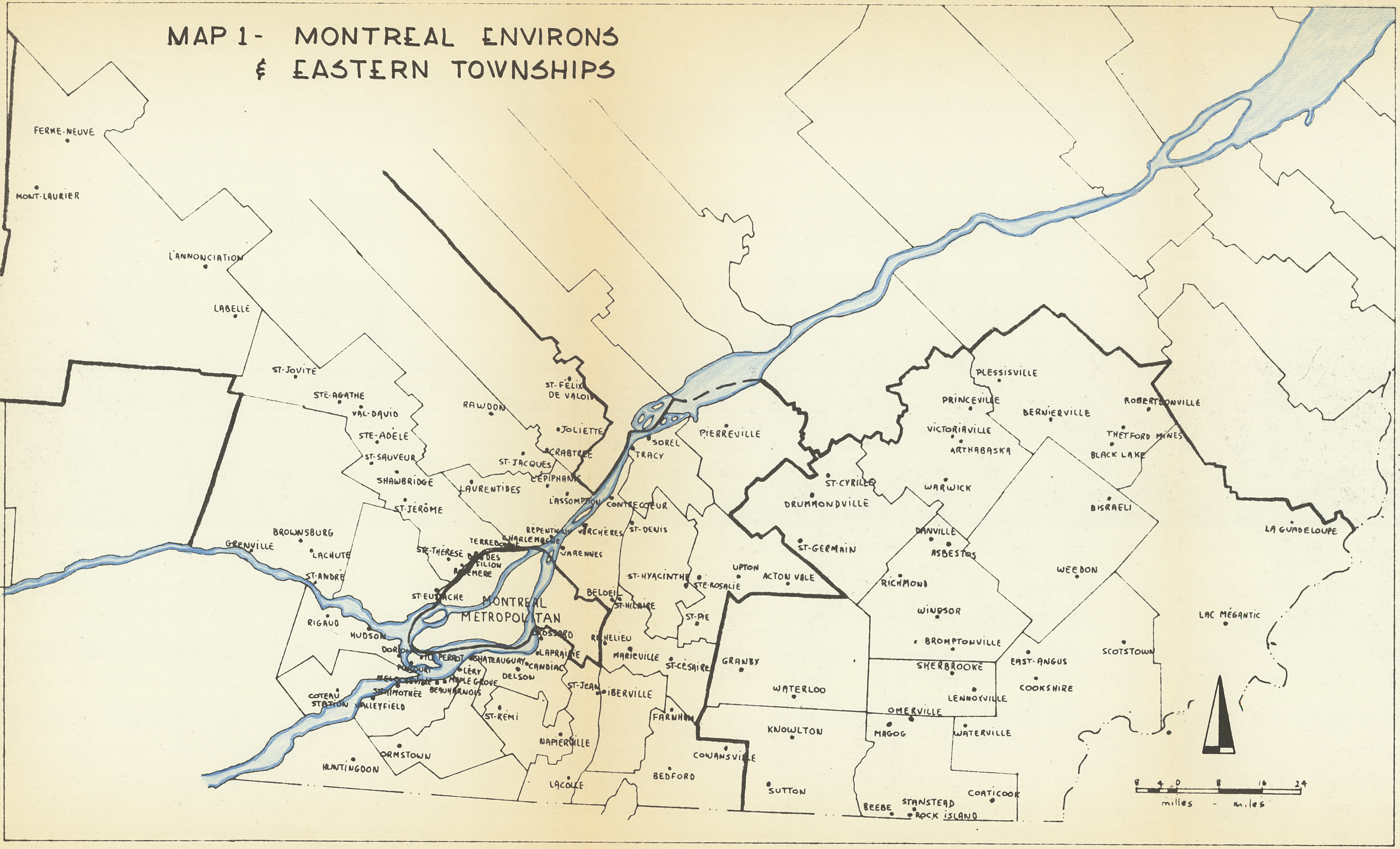
(1) Economic-Administration Zoning of Canada, including a revised version of the new D.D.P. Geographic Code. Department of Defence Production, Ottawa, June 1954.

(2) Camu, P., Weeks, E.P. and Sametz, Z.W: Economic Geography of Canada, MacMillan, Toronto, 1964

(3) Id. p. 265.

MAP 1 - MONTREAL ENVIRONS & EASTERN TOWNSHIPS



Economic Regions[1] presently used by the Province of Québec for the Montreal and Eastern Townships regions.

Camu and his associates divided the Province of Québec into ten economic regions. Two of these are Metropolitan Areas - Québec and Montreal - and the eight others divide the rest of the Province according to the before-mentioned criteria. The two regions chosen for this study were labelled Number 45, the Sherbrooke-Eastern Townships region (461,737 population) and Number 46, the Montreal Environs region (737,549 population). Both lie in the south western corner of the Province, they are adjacent to each other, and, apart from the two Metropolitan Areas, are the most urbanized regions.

Exclusion of the Montreal Metropolitan Region

For several reasons it was decided to exclude from the present study the area covered by Metropolitan Montreal, as defined by the economic regions. This means that Montreal Island, Jésus Island and Chambly County will not be taken into account in the course of the analysis.

The reasons for this exclusion are the following: 1) the complexity and the meaninglessness of municipal boundaries in the Metropolitan Area would make the analysis of individual municipalities invalid, and 2) the problems of a Metropolitan Area are different from those of a region in a hierarchical study and should not be treated on the same level.

Chambly County could have been included in the analysis, but

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(1) Quebec Yearbook 1964-1965, Department of Industry and Commerce Quebec Bureau of Statistics.

after some consideration it was decided to exclude it from the studied areas. There are two reasons that led to this decision: 1) to respect the Economic Regions as described by Camu and his associates where Chambly County is part of the Montreal Metropolitan Region and 2) examples of cases which occur in Chambly County appear in the Montreal Environs Region (the Châteauguay group for example) and they can be compared to the centres in this metropolitan county.

The Eastern Townships Region

The Eastern Townships lie in the south-eastern part of the Province of Québec. The Region covers 7,230 square miles of land.

The boundaries are: to the South and the East, the American border; to the West, the Montreal Environs Region; and to the North, the Québec and Three-Rivers Regions. The area includes eleven counties which are, from North to South: Mégantic, Arthabaska, Drummond, Wolfe, Frontenac, Richmond, Shefford, Sherbrooke, Compton, Brome and Stanstead.

The mining resources, the attraction of the relief for tourism, the vegetation, the many beautiful lakes give to the Eastern Townships distinctive features.

It is also a region of prosperous agriculture as well as one of active and diversified industry.

The name "Eastern Townships" has an historic derivation. It comes from the south-eastern areas of the Province, where colonization was organized on the basis of the English township system not on the French-Canadian seigniory.

Unlike the Montreal Region, there is no complete dominance by a regional centre in the Eastern Townships. As Blanchard very well said:

> "Il n'y a pas de grande ville dans les Cantons de l'Est; le pays est trop fragmenté et trop restreint pour avoir pu engendrer une capitale. Mais on y trouve une foule de bourgades et de petites villes, et toutes, sans exception, doivent leur développement urbain à l'industrie. C'est pourquoi, sauf les cités de gisements miniers, on les trouve à des emplacements simultanément favorables aux communications et dotés de ressources hydrauliques."(1)

Sherbrooke is the most important locality, but it is followed immediately by Granby. In the next category of centres, we find Thetford Mines; the next in importance are Victoriaville and Drummondville; Mégantic, Asbestos and Magog follow in the functional classification of Camu and his associates(2). Further in the study, we will arrive at a classification that may be very different from theirs.

From the production point of view, the region is well equipped.

The many falls have been used by the first settlers for water-mills, and later to produce electricity. Several hydro-electric plants were created at important junctions. The various industries of the region were developed from this electricity. But the one industry that is dominant is textile. The textile centres of the region are Sherbrooke, Granby, Drummondville, Coaticook, Richmond and Cowansville. The timber industry is also very active in the Townships, but it is relatively less important than textiles. Some centres have large wood-based industries, such as Victoriaville

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(1) Blanchard, R: Le Centre du Canada Francais, Montreal, 1947, p. 312

(2) Camu, P. et al, Op.Cit.

and Arthabaska for furniture, Windsor and East Angus for paper; and in many localities there are small factories where wood is transformed into low-priced objects.

The Eastern Townships have a trifocal marketing pattern with Sherbrooke for the fairly immediate area, Montreal for the North and West sides, and Québec for the north-eastern part.

The Montreal Environs Region

The Montreal Environs Region lies in the south-western part of the Province of Québec. It is a combination of the Montreal Plain and the West Central Laurentians, excluding the Montreal Metropolitan Region lying within it. It is divided into two by the St. Lawrence River which runs diagonally through the area. The Region covers 14,742 square miles.

The boundaries of the Region are: to the North, the Abitibi and Three-Rivers Regions; to the West, the Outaouais Region and the Province of Ontario; to the South, the American border, and to the East the Eastern Townships. The area covers 23 counties. On the North Shore, are the counties of Labelle, Montcalm, Joliette, Terrebonne, Argenteuil, Deux Montagnes and L'Assomption; to the West are Vaudreuil and Soulanges counties; and on the South Shore, Yamaska, Richelieu, Verchères, St. Hyacinthe, Bagot, Rouville, LaPrairie, St. Jean, Iberville, Missisquoi, Beauharnois, Châteauguay, Napierville, Huntingdon.

From the geographical point of view, the Region is divided into two distinct areas: the St. Lawrence Lowlands and the Laurentian Uplands. The City of St. Jérôme on the North River is at the junction of the two.

The Region is crossed by many navigable rivers which were

the first means of transportation. The St. Lawrence is, of course, the most important, and its tributaries - the Richelieu, the Assomption, the Ottawa and the Yamaska - complete the hydrographic system.

From the functional point of view, the Montreal Region has a constellation of smaller centres surrounding the metropolis, having close functional ties with that centre.

The Montreal Region is much more urbanized than the Eastern Townships. Its urban network is denser, at least in the area surrounding Montreal proper. Unlike the Townships, it has a dominating centre which influenced greatly the pattern of urbanization in the Region.

According to the classification of Camu and his associates, Joliette and Farnham are 4th-order centres; Sorel, St. Jean, Beauharnois, Valleyfield, Ste. Thérese, St. Jérôme, St. Agathe and Lachute are 2nd-order localities; Mont Laurier and Cowansville are 1st-order centres. But here again, after analysis, our classification, having a different basis, we will undoubtedly arrive at different groupings.

Production-wise the Montreal Region is favourably equipped.

In the Lowlands, there is highly diversified manufacturing. Montreal Metropolitan has of course the control over most of the manufacturing industries. But because of good means of communications - rivers, railways and roads - manufacturing has spread over the whole region. There are few real industries in rural areas. The more important industrial centres are nearer to Montreal and already have some importance function-wise. Large workers' settlements are Valleyfield, Joliette, St. Jean and St.Hyacinthe.

Although there is good farmland surrounding Montreal, in

recent years the spread of urbanization has endangered the agriculture. Indeed land speculation for urban development is very strong and farms are abandoned for speculation purposes.

The Laurentians, with their mountains and lakes offer year-round facilities to tourists.

Because of the presence of Montreal, the Region has strong marketing and production ties with the Metropolis. The impact is much more noticeable here than in the Eastern Townships and it is one of the reasons for the growth of urban development in the area.

2. Québec Administrative Regions

The Department of Industry and Commerce of the Province of Québec recently made a study of the centres in the whole Province.

The purpose of this study was to remake the map of the Quebec economic regions, so that in the future the regions become administrative units oriented towards economic and industrial development. To reach this objective, areas of influence of the major centres were determined so as to define regions with central-cities.

A questionnaire was sent to the secretary, the parish priest and the manager of the Caisse Populaire of every municipality having less than 5,000 inhabitants. They were asked to state, according to their opinion, the first and second choice of the people living in the municipality regarding the places where they went for daily shopping, occasional purchases (for example, furniture), various professional services and different other services. Categories of central places emerged from this survey, according to the

size of the hinterlands.

Montreal and Sherbrooke were classified as major cities with large hinterlands. In the next category we find Mont-Laurier, St.Jérôme, Joliette, Valleyfield, St. Jean, St. Hyacinthe, Sorel, Drummondville, Granby, Victoriaville and Thetford Mines.

The third class of centres includes St. Jovite, St. Agathe, Lachute, Beauharnois, Bedford, Cowansville, Waterloo, Magog, Coaticook, Lac Mégantic, Asbestos and Plessisville.

Administrative Regions were then determined, according to the results of the study on poles of attraction and hinterlands of the urban centres in the Province of Québec.

Map 8 illustrates these administrative regions and the major classes of centres, for the area with which we are concerned.

3. Selection of Centres

This analysis tends to study all the incorporated centres of 1,000 and more inhabitants in the Montreal Environs and Eastern Townships Regions. These prerequisites had to be drawn because of the availability of data. The census figures for the non-incorporated places are very incoherent and incomplete, and therefore cannot be taken seriously into account. The most useful figures for the study are given in the Census only for settlements having a population of 1,000 and more. There are 38 such localities in the Eastern Townships and 72 in the Montreal Environs.

From the legal point of view, the centres are divided into 3 categories: villages, towns and cities. According to the Municipal Code, a village must have at least 40 inhabited houses (plus other considerations); the Cities and Towns Act states that a town should

have a minimum of 2,000 souls and a city at least 6,000. However, under certain conditions, these minima can be relaxed, and thus one finds places like the towns of Cookshire and Candiac with populations under 2,000, and villages like Brownsburg and Princeville having more than 3,000 inhabitants. So one cannot rely on these denominations as a realistic criterion for the classification of urban settlements.

A further problem was raised by adjacent municipalities with continuous urban development which all but legally form a single urban centre. In the case where the extent of urbanization offered no breaks and the municipalities had some economic ties, they were grouped as one, and the figures apply throughout the whole analysis. These groups appear on Table 1, where the figures refer to the 1961 population.

In certain areas, urban development is continuous but there are geographical barriers that separate the centres, such as Sorel and Tracy, St. Jean and Iberville, Beloeil and St. Hilaire. In these cases, the municipalities were not grouped.

Map 2 illustrates examples of grouped municipalities with continuous urban development (the coloured areas being the urbanized land as of 1961).

St. Joseph de Sorel, Drummondville West and Ayersville are adjacent respectively to Sorel, Drummondville and Lachute and urbanization presents no major breaks in all three cases.

Chateauguay Centre, in the Chateauguay group, is a special case. Even though there is a break in the urbanized land, there

are no functions in the locality, all the central-place functions being located either in Chateauguay Town or Chateauguay Heights. The three municipalities were grouped as one. This is a good example of what can be found in Chambly County, it is a characteristic of metropolitan-dominated areas.

4. Method of Work

The physical and urban characteristics of the Regions did not allow us to use a predetermined method of work. We were therefore unable to begin with an overall hypothesis regarding the size and arrangement of settlements since none exists which accomodates our Regions. The Eastern Townships study, because of the relative homogeneity and absence of a dominating centre in the Region, could have been modeled after an existing hypothesis. But then, the comparison would not have been on the same level and it would have become difficult to arrive at concordant conclusions. It was decided, however, to adopt various assumptions from other work in the field.*

Similarly, it was not possible to find a comprehensive study on which to model our method of work, and consequently we had to borrow a variety of approaches from a number of sources, some of which were fruitful for our purposes and some not. These are described in the course of the analysis since they may throw some light on how and why we arrived at the criteria eventually used.

We are aware that central-place and hierarchical models do exist, and they are mentioned above in the thesis.** A further

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* Woroby, Berry and Garrison, Op.Cit.

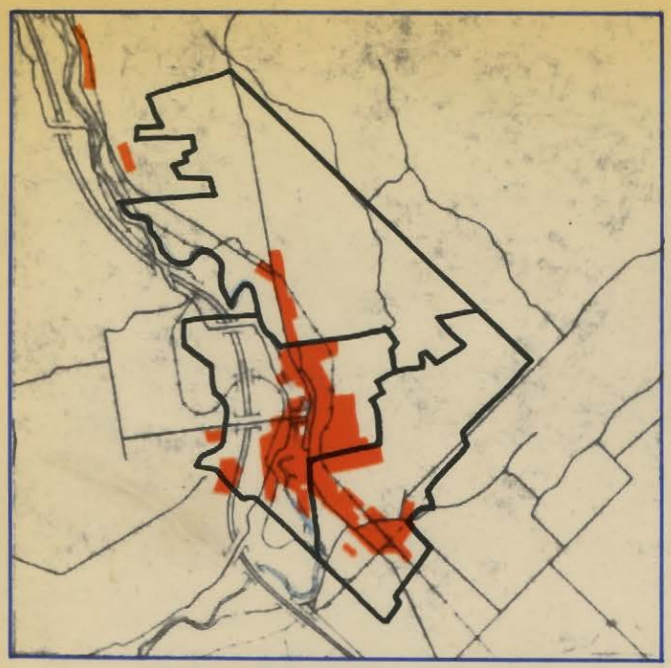
** See Berry, Teitz, Nystuen and Dacey, Op. Cit.

TABLE I

MUNICIPALITIES WITH CONTINUOUS URBAN DEVELOPMENT

St. Hyacinthe	St. Hyacinthe	22,354
	La Providence	4,251
	St. Joseph	3,799
		30,404
St. Jérôme	St. Jérôme	24,546
	St. Antoine des Laurentides	3,005
	Lafontaine	1,331
		28,882
Drummondville	Drummondville	27,909
	Drummondville West	2,057
		29,966
Sorel	Sorel	17,147
	St. Joseph-de-Sorel	3,588
		20,735
Châteauguay	Châteauguay	7,570
	Châteauguay Centre	7,591
	Châteauguay Heights	1,231
		16,392
St. Eustache	St. Eustache	5,463
	Deux-Montagnes (St. Eustache-sur-le-Lac)	7,294
		12,737
Lachute	Lachute	7,560
	Ayersville	2,957
		10,517
Beloeil	Beloeil	6,283
	McMasterville	2,075
		8,358
Hudson	Hudson	1,671
	Hudson Heights	1,540
		3,211

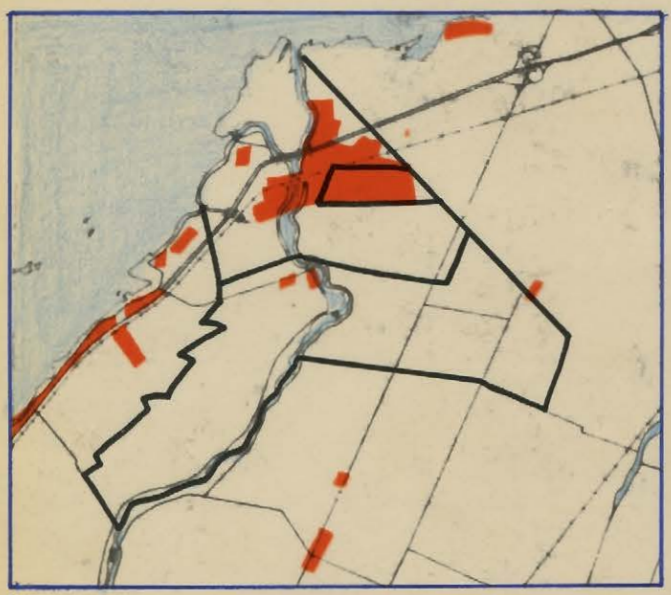
Map 2. GROUPED MUNICIPALITIES



St-Jérôme

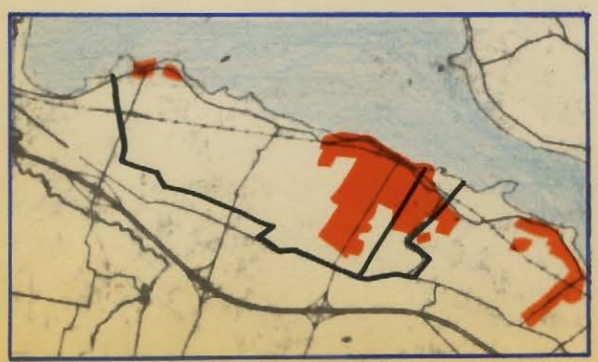
Beloeil

St-Eustache

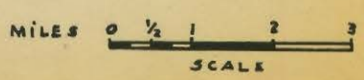


Chateauguay

St-Hyacinthe



Hudson

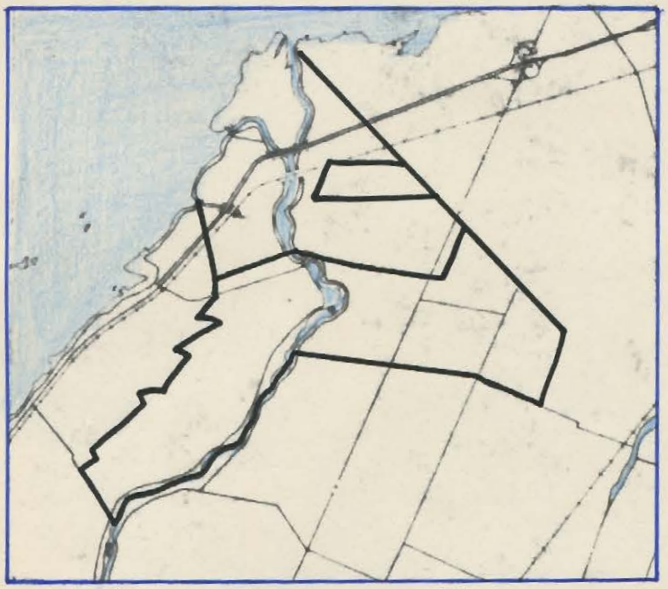


Map 2. GROUPED MUNICIPALITIES

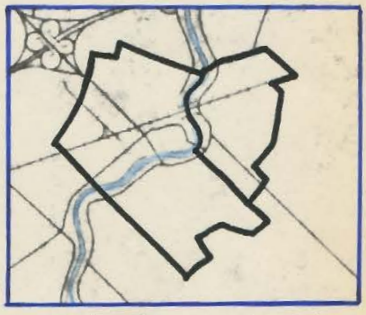
St-Jérôme

Beloeil

St-Eustache

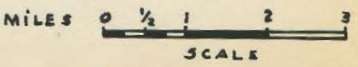


Chateauguay



St-Hyacinthe

Hudson



example is that of Berry, Barnum and Tennant* in which the authors describe a central-place hierarchy based on the spatial aspects of retail and service functions. In this study, the authors used factor analysis to arrive at groupings of centres according to cities, towns and villages. Thepatterns produced by this factor analysis provide logical interpretations of the various regimes appearing in graphs. The results of their study is the location and groupings of central-place functions, the consequent size and spacing of central places, the consumer travel behaviour and the size, shape and arrangement of trade areas. However, the method devised by these authors proved too complicated for our purposes and in addition did not apply to the two studied Regions.

The base of the analysis is the data appearing on the Function Table** which lists the centres of the Montreal Environs and the Eastern Townships in numerical order according to the population size. This is by no means an exhaustive list of functions, many others could be added. Even though the choice of functions was arbitrary and subjective, they are adequately representative of the variety and complexity of central places.

The information gathered from various sources was plotted on this Function Table and the 1961 Census classification of Industries was used to tabulate the data. The following groups of functions were formed:

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* Berry, B.J.L., Barnum, H.G. and Tennant, R.J., Retail Location and Consumer Behaviour, Papers and Proceedings of the Regional Science Association, Vol. 9, 1962, pp. 65-106.

** See Appendix 2.

- Public Administration:

  Judicial Centre
  County Town
  Québec Provincial Police Office

- Transportation, Communication and Other Utilities:

  - Transportation

    Railway Station

  - Communication

    Radio Station
    Television Station
    Bell Telephone Office
    Post Office

  - Electric Power

    Hydro-Québec Office

- Finance

  Bank

- Community, Business and Personal Service Industries:

  - Education

    Regional School Commission Registered Office
    Secondary School
    Vocational School.
    University and College
    Libraries (Public)

  - Health

    Hospital
    Doctor
    Dentist

  - Religious Services

    Diocesan Centre
    Catholic Church

  - Services to Business Management

    Lawyer
    Notary

  - Personal Services

    Hotels and Motels

- Other Services

Newspaper - Daily
" - Weekly
Chamber of Commerce
Farmers Club
National Employment Service Office
Agronome

For further comparison purposes, we added to our table the number of retail stores.

Population and Function Analysis

The first part of our study is a population analysis. We have classified the centres according to their respective size. The data was obtained from the 1961 Census of Canada. We plotted the data on graphs and then proceeded to make arbitrary groupings. The results are discussed in Chapter Three.

Because of the doubtful validity of a classification based on population, we then made a functional classification of the centres in our two Regions. The method of work in this case consisted of adding up the different functions and then plotting the totals, for each settlement, on a graph. Two approaches were used for the functional analysis: first, by the rank-function relationship, and second, by the size-function relationship. Chapter Four describes in more detail the analysis and results of the functional study.

Shopping Study

The mass of centres below the 5,000 population level proving more complex to sort out, we then proceeded to make an analysis of the shopping facilities in the centres. Using the number of retail stores and the shopping receipts, we measured the importance of settlements in the regions as retail centres,

with the aid of the "Unadjusted Index of Local Specialization" as described by Mattila and Thompson(1). This index was originally devised to demonstrate "the importance of any industry to its locality relative to the importance of an industry to the nation". In our study, it is used to compare the relative importance of retail centres within the regional context. Put another way, this index shows whether the value of shopping in any one centre is greater or less than the regional average considering its size.

A further calculation was made on retail receipts to express this imbalance or outbalance of trade in dollars for the purpose of comparing centres of different sizes. This was done by taking the average regional per-capita receipts multiplied by the population of a centre from the actual receipts of that centre. Chapter Five studies the shopping facilities of the two Regions.

Classification

The next chapter consists of two parts: first is the summary of the classification. The different categories of settlements are described according to their distinctive and differentiating characteristics. This classification derives from the preceding studies. The second part lists the centres by categories. It includes the main classes of settlements, their distinctive characteristics, the number of centres in each category and the centres themselves.

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(1) Mattila, J.M. and Thompson, W.R: The Measurement of The Economic Base of the Metropolitan Area. Land Economics, Vol. XXX, No. 3, August 1955, pp. 215-228.

5. Notes on the Terminology

In the course of the study, a certain terminology had to be adopted which not always corresponded to the classical definition. This became necessary because of the rarity of such studies in our areas. Particular characteristics and the inovating approach determined the use of the vocabulary. Some terms have to be defined so as not to bring confusion or misunderstanding.

The word Region in the context refers to either the Montreal Environs or Eastern Townships regions as defined by the Québec Department of Industry and Commerce (1965) and by Camu and his associates.

When the term "urban system" is used, it refers to groups of towns arranged in categories, while regional system concerns groups of towns arranged in categories within a region.

The words centre and locality have been used in the text to refer generally to all cities, towns and villages.

The term service centre should apply only to settlements which have a functional interdependence with the surrounding rural area. Towns with a fortuitous location such as mining or hydro towns should theoretically be excluded from a service-centre study although, in fact, they rapidly assume at least some attributes of the service centres. These attributes are called central place functions. Banks, post offices, hospitals, stores, insurance offices, and all urban activity which entices people to come into a centre are considered central place functions. It is usually on the number of these that the importance of a place and consequently its level in the hierarchy is determined. The term

function used in the context of the central place function should not be confused with functional classification. In our study, we will use it in the first sense.

6. Sources of Information

A complete list of the sources is shown in Appendix 1. It comprises information from the Census of Canada, the Canadian Almanac, private communications with provincial authorities, public and private corporations and others.

The Census provides the basic data for population and retail trade. Unfortunately, the labour force figures are not published for centres with less than 5,000 population. To complement the study, it was necessary to use other sources of information.

The data for the urban functions of the centres was derived from a great variety of sources and this made it very difficult to arrive at coherent results. However, for the purpose of the study, these figures proved sufficient and they are the basis for the function table.

Some may question the validity of this method, since computors have been widely used in urban studies recently. However, we think that the method used gives satisfying results and serves our purposes. But we are quite sure that the information gathered is the most detailed available considering the range in the size of the centres - the majority having less than 5,000 inhabitants.

CHAPTER THREE

POPULATION

1. Range of Population in the Two Regions

The population figures for 1961(1) appear in Appendix 2. They are given for the two Regions in numerical order.

Since only the incorporated centres having 1,000 and more inhabitants are studied, the lowest populations of the centres for both Regions are identical. But there are some differences in the highest figures. The most important centre of the Montreal Region, St. Hyacinthe, has some 30,000 inhabitants while Sherbrooke, the largest centre in the Eastern Townships, has more than 66,000 inhabitants. This last figure, however, can be misleading, because if we consider the second largest centre in this Region, Granby, we discover that its population is 31,000. So if we take Sherbrooke as being an exception, or shall we say as being an exceptional centre, the settlements in both Regions have about the same range of population. It is the distribution of these populations within each Region that presents dissimilarities. This is shown on Graph 1 where the centres were plotted separately for the two Regions according to their rank and size.

The Montreal Region curve offers less breaks than the Eastern Townships one, it has a more continuous distribution. The grouping of centres, especially the ones below 1,500, is almost impossible. Even in the larger settlements, the breaks are not significant except for the four largest. The Eastern Townships

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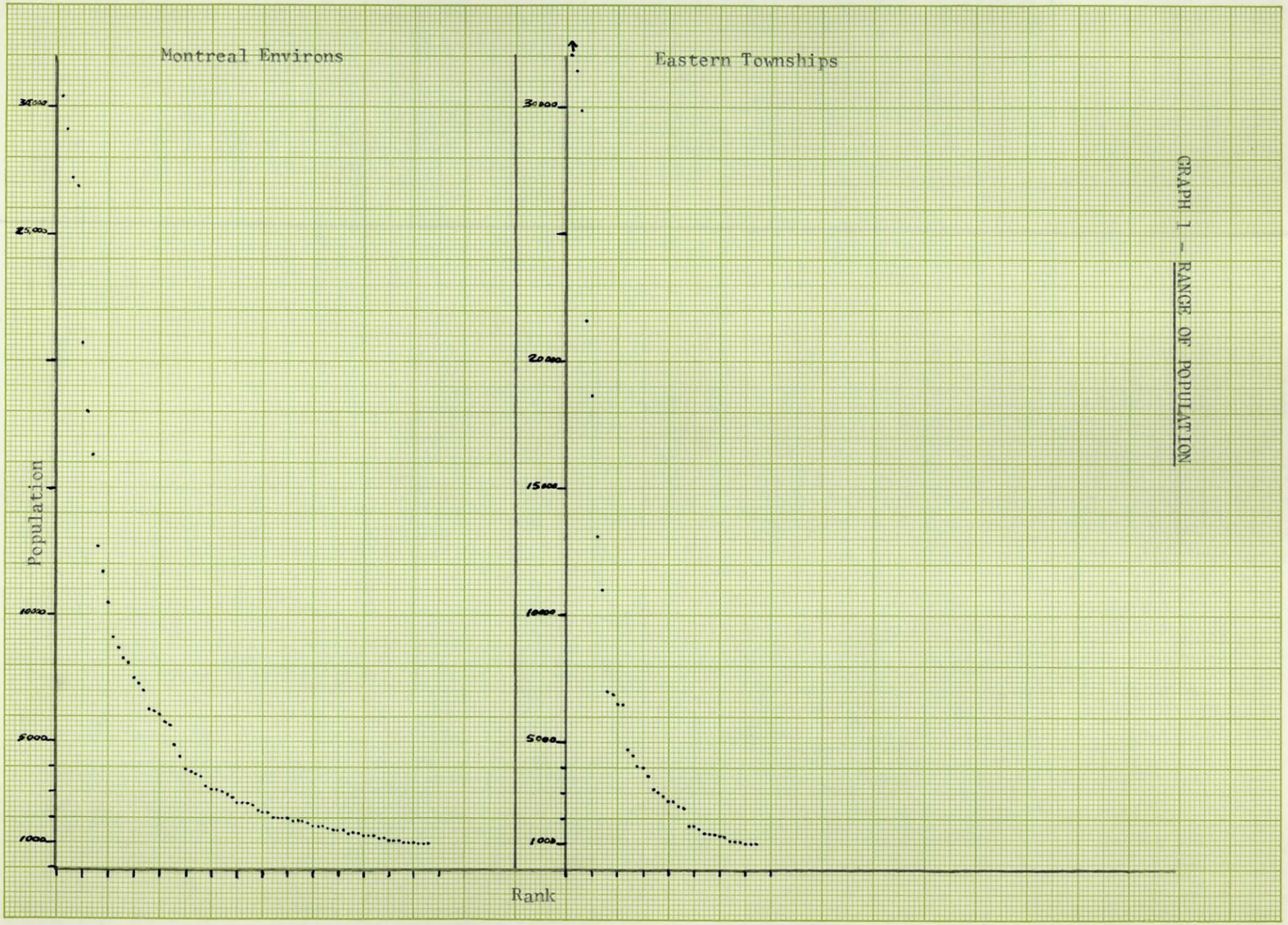
(1) Census of Canada, 1961: Bulletin 1.1-3, D.B.S., Ottawa.



curve is more abrupt, and groups of settlements appear clearly, being separated by considerable breaks.

After a study of the rank-size graphs for the two Regions, it would appear that the Montreal Region has a more even distribution of urban centres, apart from having a larger number of centres. This tends to show at this point that the Region has a more regular and denser urban network.

On the other hand, the centres in the Eastern Townships offer an easier approach to a classification since groupings appear at this early stage of the analysis.

The presence of significant differences between frequencies in the two Regions indicates the operation of differential forces of urbanization. This point which has been noted previously will undoubtedly rise again and conclusions will be drawn accordingly. However, these groupings will probably vary in some ways as we proceed further into the analysis.

2. Purpose of a Population Study

The customary and easiest method to classify towns is by the population, if it is understood that the number of persons living in a centre is a manifestation of its importance. But the sole reliance on size as a basis for a classification can be misleading. Indeed this method provides an indifferent index of the functional activity of a centre since it does not take into consideration any of the functions. A town can have few inhabitants, but many service and functional activities (e.g. St. Sauveur), while another town may have a large population but few activities, as for example a dormitory settlement (e.g. Léry).

A more serious objection to the population method of

analysis is that the class intervals are two broad and arbitrary to have any analytic value.

The population study was made for two reasons: first, to put into evidence the variety in the size of the centres in both Regions, and second, to see whether major breaks occurred in the distribution of centres which could render the classification clearer.

The results of such an analysis can serve as a guide for a further classification. It is a first step towards a better understanding of the urban systems in both Regions.

3. Rank-Size Rule

One method used for analyzing towns according to their population is the rank-size process.

a) Examples of methods used:

Zipf[1] used the rank-size rule in the 1940s. His discussion was set within a general theory of human behaviour and he presented evidence of strong rank-size relationships. He illustrated that various phenomena, of which the distribution of cities according to size, give empirically what seems to be a regular relationship when compiled in this manner.

Another empirical approach to the rank-size problem is the Pareto formula:

$$Y = Ax^{-a}$$

The symbols have the following meanings: x is the size

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(1) Zipf, G.K: "Human Behaviour and the Principle of Least Effort". Addison-Wesley Press Inc., Cambridge, 1949. Discussion in Berry, B.J.L., Garrison, W.L., "Alternate Explanations of Urban Rank-Size Relationships", Annals of the AM. ASS. of Geographers, XLVIII, March, 1958.

(number of inhabitants of a community), Y, the number of communities of size x or larger, and A and a are empirical parameters estimated from the size distribution.

The Pareto formula reduces the rank-size rule which expresses the size of a given community as the quotient of the size of the largest community divided by the rank of the given community. The Pareto or "rank-size" formula cannot hold for the smallest sizes of settlements. However, although the Pareto distribution is compatible with the central-place scheme, an empirical fit of the Pareto curve hardly validates the central-place theory in detail.

If we accept Zipf's rule, we can proceed to a classification of the centres in both Regions according to their rank and size. "It is clear that, in any case, the available explanation for city-size relationships is a base on which to build or to relate city-size relationships to other relationships. It is certainly not the answer to all city-size problems."(1)

With this last restriction in mind, we will now proceed to the actual population analysis.

b) Rank-Size Analysis

A rank-size graph was constructed (see Graph 2), the largest city ranking number 1, the second largest number 2, and so on for both Regions. These ranks were plotted against city population size and some relationships emerged.

The most important breaks appearing on the curve were the

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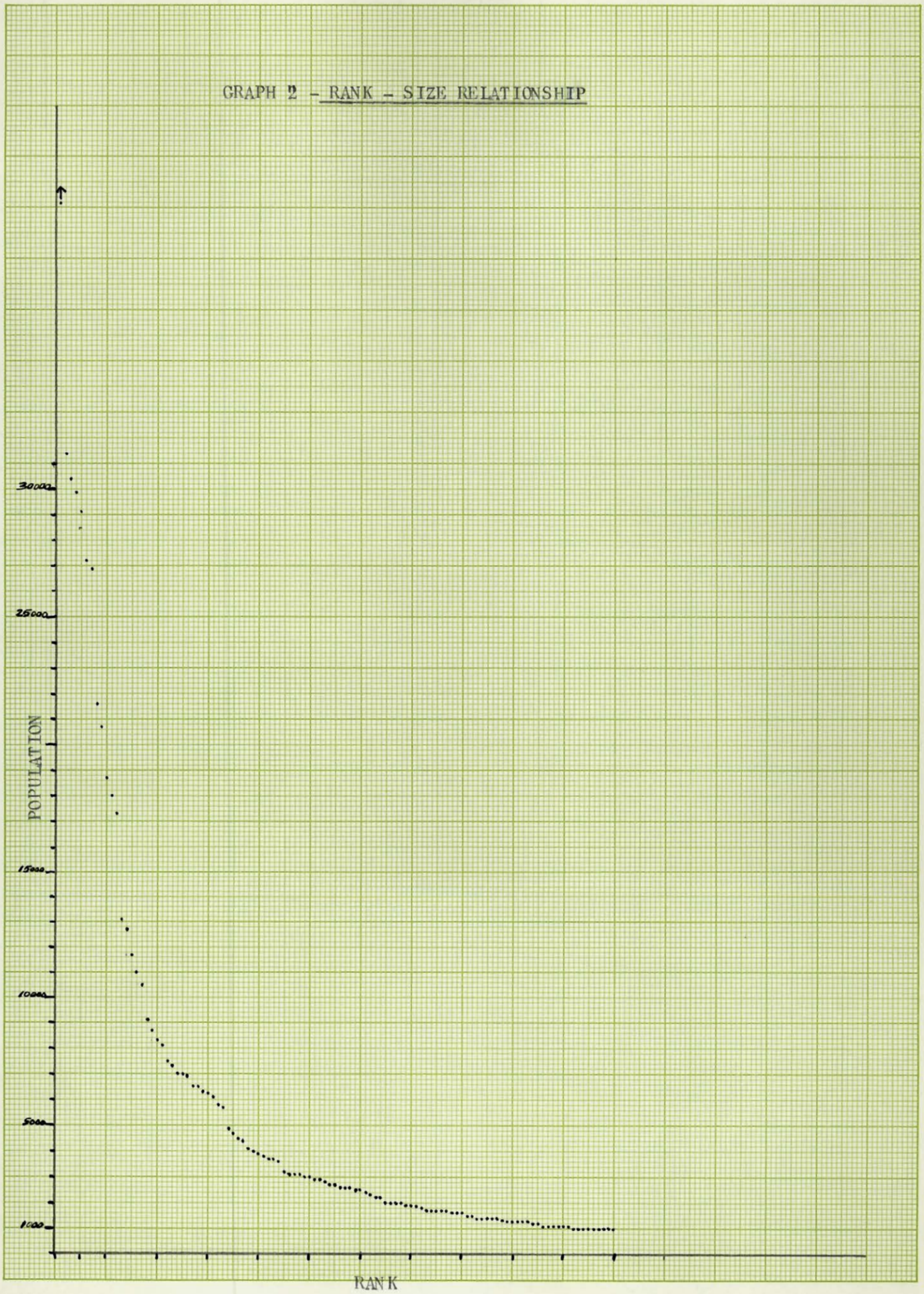
(1) Berry, B.J.L. and Garrison, W.L: Alternate Explanations of Urban Rank-Size Relationships, in Readings in Urban Geography, Mayer, H.M., and Kohn, C.E. ed, Chicago, 1959 p. 239.

GRAPH 2 - RANK - SIZE RELATIONSHIP



basis for the grouping of centres. There, breaks are more or less evident as we go down to the smaller settlements.

The following categories were formed:

1. 35,000+ population
2. 25,000 - 35,000 "
3. 15,000 - 25,000 "
4. 10,000 - 15,000 "
5. 5,000 - 10,000 "
6. 3,500 - 5,000 "
7. 1,000 - 3,500 "

Map 3 illustrates these classes

There is one centre in the first category, Sherbrooke, which is located in the Eastern Townships. The second category groups 6 centres, Granby and Drummondville in the Eastern Townships; St. Hyacinthe, St. Jérôme, Valleyfield and St. Jean in the Montreal Environs. There are 5 localities in the third group, Thetford Mines and Victoriaville in the Eastern Townships; Sorel, Joliette and Châteauguay in the Montreal Environs. The fourth category includes 5 centres of which two are located in the Eastern Townships (Magog and Asbestos) and three in the Montreal Environs (St. Eustache, Ste. Thérèse and Lachute).

The fifth class of centres comprises 16 localities (4 in the Eastern Townships and 12 in the Montreal Environs).

The sixth class has 14 centres (five in the Eastern Townships and nine in the Montreal Environs) and the seventh, 73 (21 in the Eastern Townships and 42 in the Montreal Environs).

This last category of centres is very complex and will have to be analysed further so as to bring out the characteristics

MAP 3- POPULATION OF CENTRES

35,000 +

25,000 - 35,000

15,000 - 25,000

10,000 - 15,000

5,000 - 10,000

3,500 - 5,000

1,000 - 3,500

8 4 0 8 16 24

miles - miles

of this mass of settlements.

4. Population Change 1951-1961

Another method based on population was used to verify the early-established classification. This time the variations in size from 1951 to 1961 was used.

a) Change in Percentage

The change in percentage varies considerably within both Regions for this period. The figures were taken from the 1951 and 1961 Census of Population.

In the Eastern-Townships the population of the centres studied increased from 206,166 to 279,157 or by 35.4%; while the centres in the Montreal Environs grew from 252,144 to 398,899, or by 52.8%.

The percentage of population change for the centres of both Regions vary from -23% to +415% (Scotstown and Châteauguay).

The following categories were formed:

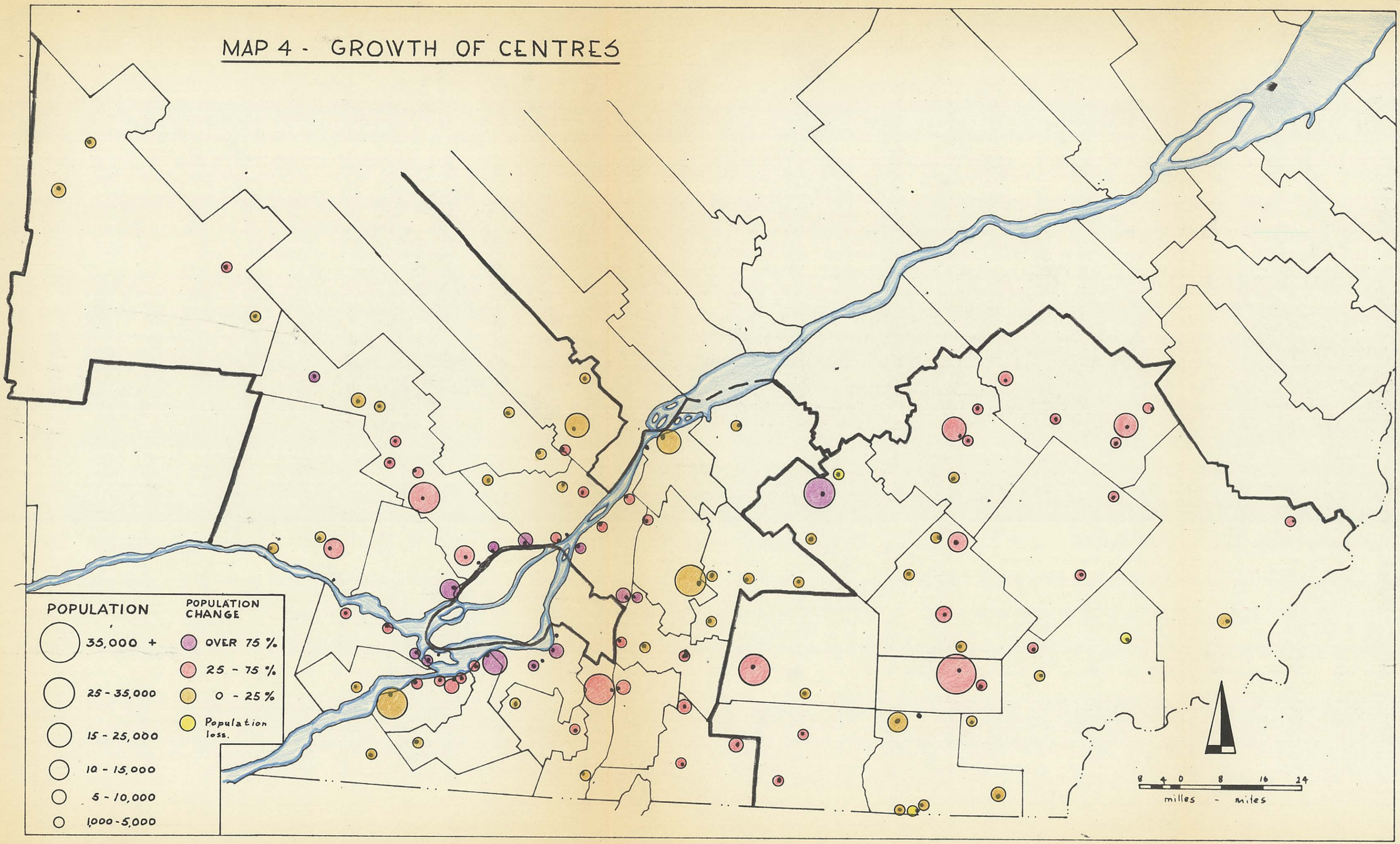
1. Centres which increased by 75 - 100%
2. " " " 25 - 75%
3. " " " 0 - 25%
4. " " had a loss of population.

We classified the centres according to these categories and the resulting groups appear on Map 4.

The municipalities in the first category grew at a very rapid pace. There is only one centre in the Eastern Townships in this category. The Montreal Environs Region possesses the other 12 centres.

The second category groups localities with a moderate growth. Half the centres in the Eastern Townships are found in this group.

MAP 4 - GROWTH OF CENTRES



The centres in the third category grew at a slower pace. Almost a third of the localities in the Eastern Townships fall into this category.

The only three centres which has a loss of population for the period 1951-61 are located in the Eastern Townships.

The results of this analysis of the growth of centres shows the importance of the Metropolis. The centres which had the most rapid growth (except St. Jovite) are in the radius not exceeding 20 miles from downtown Montreal. The surrounding localities followed the rapid growth of the Metropolis.

The absence of such a centre in the Eastern Townships explains the relatively moderate growth of the centres in this Region.

b) Change in Absolute Numbers

Another method based on the change in population was used to see whether it would add to our knowledge of the centres.

A graph was constructed (Graph 3) with the 1951 and 1961 populations of the centres in both Regions. The following groups of localities emerged:

CLASS I:	Sherbrooke
	Granby
	Drummondville
	St. Hyacinthe
	St. Jérôme
	Valleyfield
	St. Jean
CLASS II:	Thetford Mines
	Sorel
	Victoriaville
	Joliette
CLASS III:	St. Eustache
	Ste. Thérèse
	Asbestos
	Lachute

CLASS IV:
Beauharnois
Beloeil
Iberville
Laprairie
Cowansville
Lac Mégantic
Coaticook
Windsor
Plessisville
Farnham
Terrebonne
Mt. Laurier
Ste. Agathe

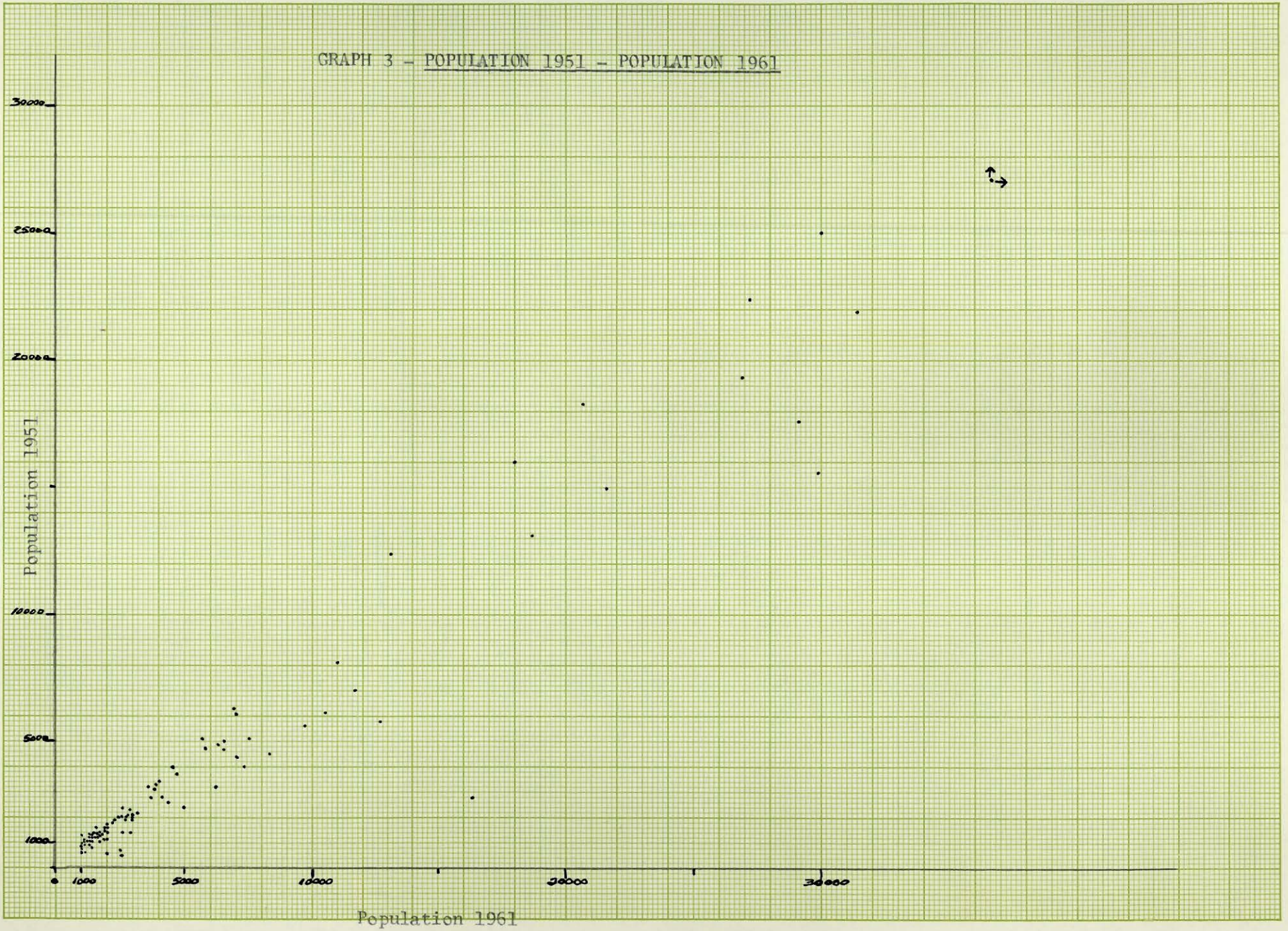
CLASS V:
Dorion
E. Angus
Waterloo
L'Assomption
Black Lake
Richemont
Acton Vale
Marieville
Lennox
Brownsburg
Huntingdon

CLASS VI:
The remaining centres except the following which were not incorporated in 1951:

Ile Perrot
St. Andrew East
Candiac
Omerville

These categories correspond to the ones established by the rank-size analysis, except for the centres that were not incorporated in 1951 and that do not appear in the population change analysis. Châteauguay and Magog are outside the categories formed.

GRAPH 3 - POPULATION 1951 - POPULATION 1961



CHAPTER FOUR

FUNCTIONS

1. Rank - Function Relationship

Because the population analysis left uncertainties as to the classification of centres, we will base the next step of our study on a more relevant factor which is the functions of the centres.

According to central-place theory, each category of centres in a hierarchy possesses specific groups of central functions (associated to the different population levels) arranged so that the more complex classes possess all the functions found in the less complex classes, plus a group of differentiating functions. This was assumed at the beginning.

Some may question the validity of adding such things as a newspaper, a lawyer, a post office; but if these objects can be considered as urban functions and not as separated entities, the adding up becomes less daring.

From the data appearing in Appendix 2 we drew a graph of the rank-function relationship (graph 4).

The functions range from 1 to 341. This last figure belongs to Sherbrooke and since we consider this centre as a particular case, we can say that the range is really from 1 to 156. "The problem of classifying (centres) into a limited number of types involves a considerable element of subjective judgment."(1)

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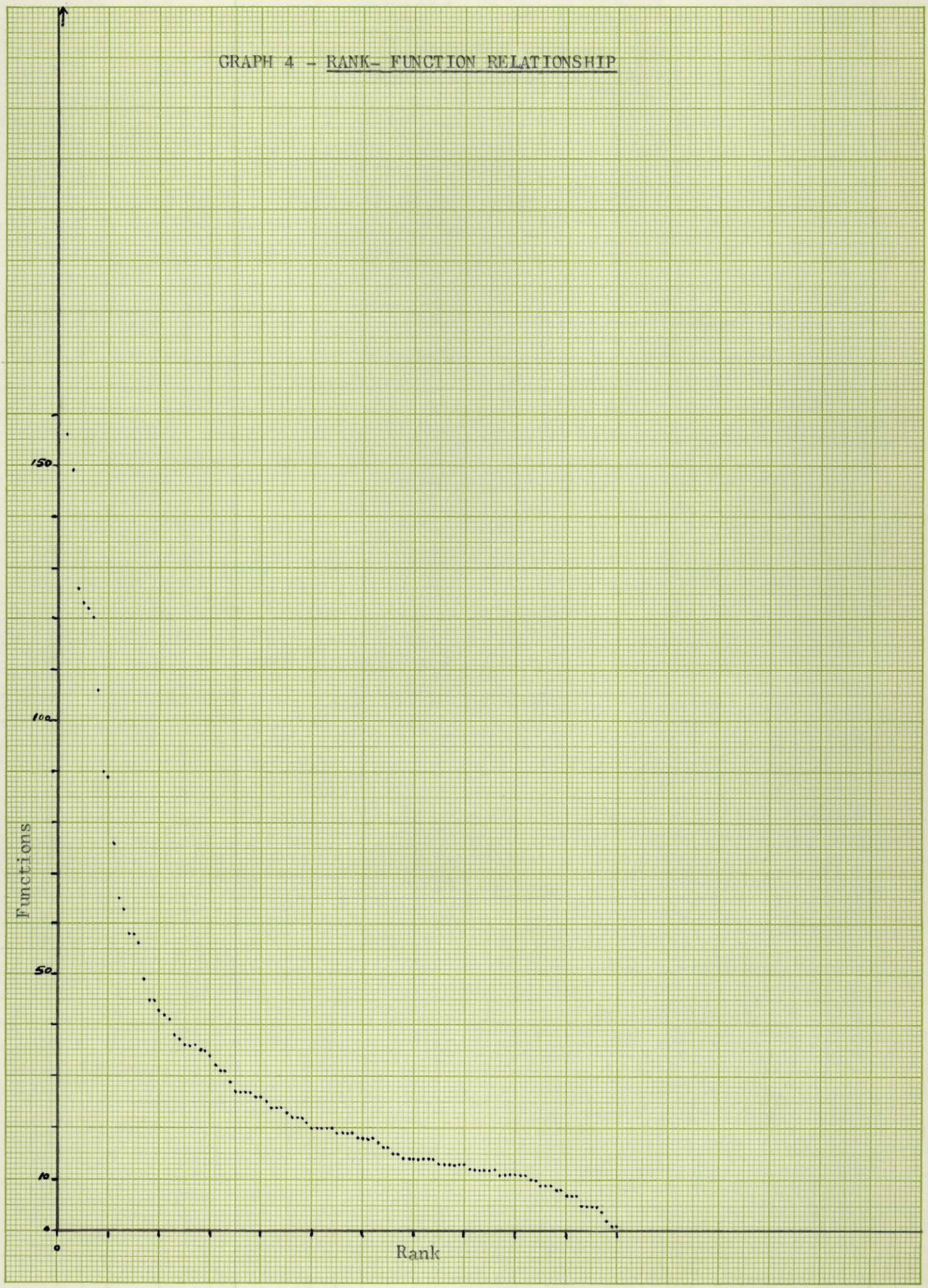
(1) Woroby, P: op.cit. p. 29.

GRAPH 4 - RANK- FUNCTION RELATIONSHIP



Using the same method as for the population study we constructed a rank-function graph to see whether any major breaks occurred.

The breaks are not as apparent as on the population graph. Sherbrooke stands out definitely with 341 and a distinct break occurs after the next two centres: St. Hyacinthe (156) and Drummondville (149). Below these levels, there is a discontinuity around 115, between 75 and 110 and between 50 and 70. Below, the curve slowly descends towards one. The mass of localities in this last category had to be broken down, so we made an arbitrary separation at 25. The following categories were established:

1. 161 and more functions
2. 141 - 160
3. 111 - 140
4. 75 - 110
5. 51 - 75
6. 25 - 50
7. 1 - 25

Map 5 illustrates the centres grouped according to the number of functions. There are four centres in the third category, Joliette (126), Granby (123), St. Jérôme (122) and St. Jean (120). The fourth category groups four municipalities, Valleyfield (106), Thetford Mines (90), Sorel (89) and Victoriaville (76). The fifth category has five localities, Ste. Agathe (65), Magog (63), Lachute (58), Ste. Thérèse (58) and St. Eustache (56).

These categories correspond to the ones established by the population analysis except for Châteauguay which has a population of more than 16,000 but only 45 functions. This centre will be studied further.

2. Size-Function Relationship

Graph 5 shows the next step which is the relationship

MAP 5 - FUNCTIONS

161	+
141	- 160
111	- 140
76	- 110
51	- 75
26	- 50
1	25

8 4 0 8 16 24
miles - miles

between the size and the number of functions in each centre. Map 6 illustrates the size-function relationship of the centres.

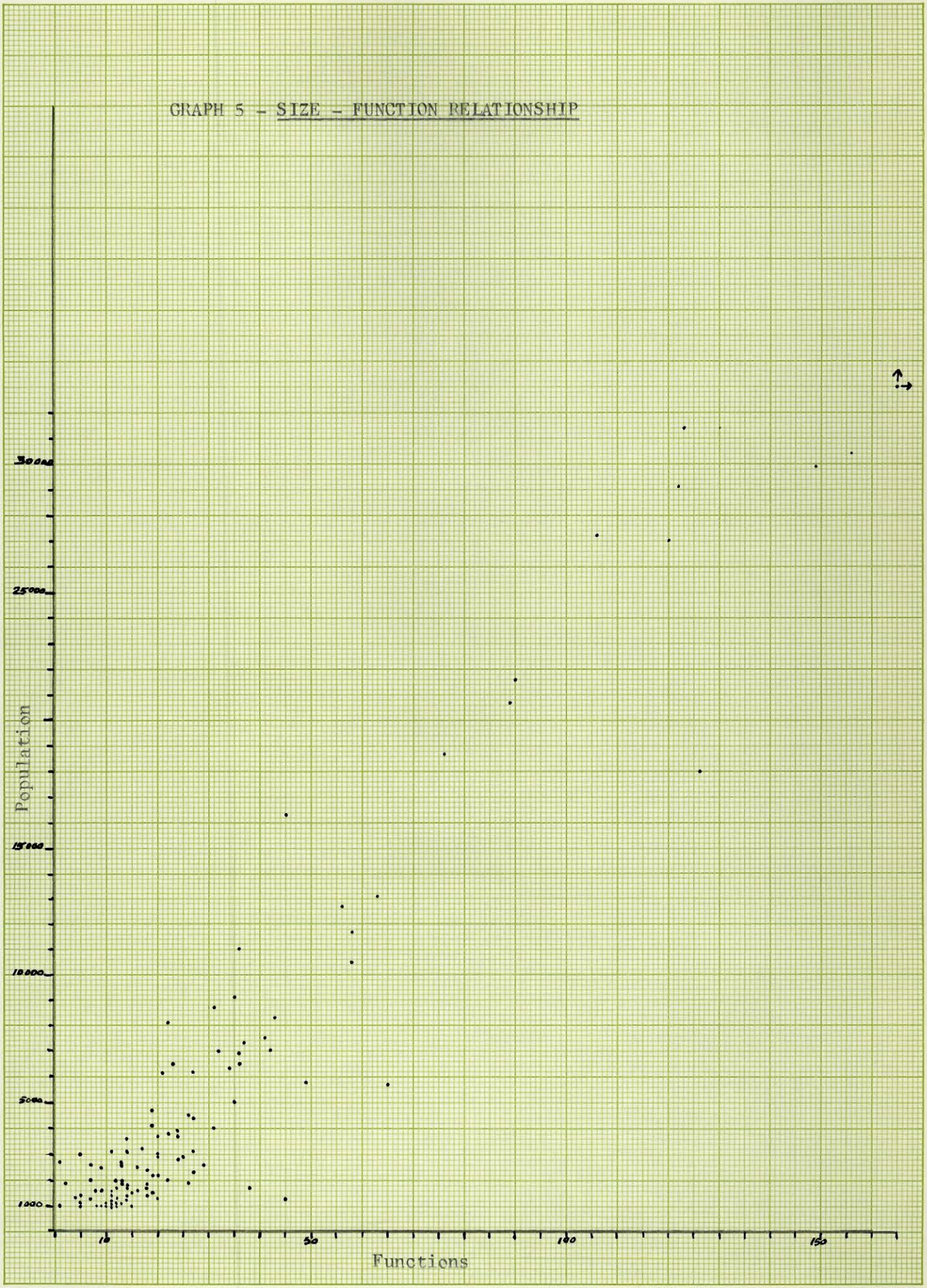
Sherbrooke, which we will call a Regional Capital, stands out very well in Class I, having the largest population and the larges number of functions.

In the next grouping, which we will class Class II or Cities, there are two centres with populations exceeding 29,000 and more than 148 functions, (St. Hyacinthe and Drummondville). The third category of centres which is called Class III, groups four localities or Towns with more than 26,000 inhabitants and 105 functions. They are Granby, St. Jérôme, St. Jean and Valleyfield.

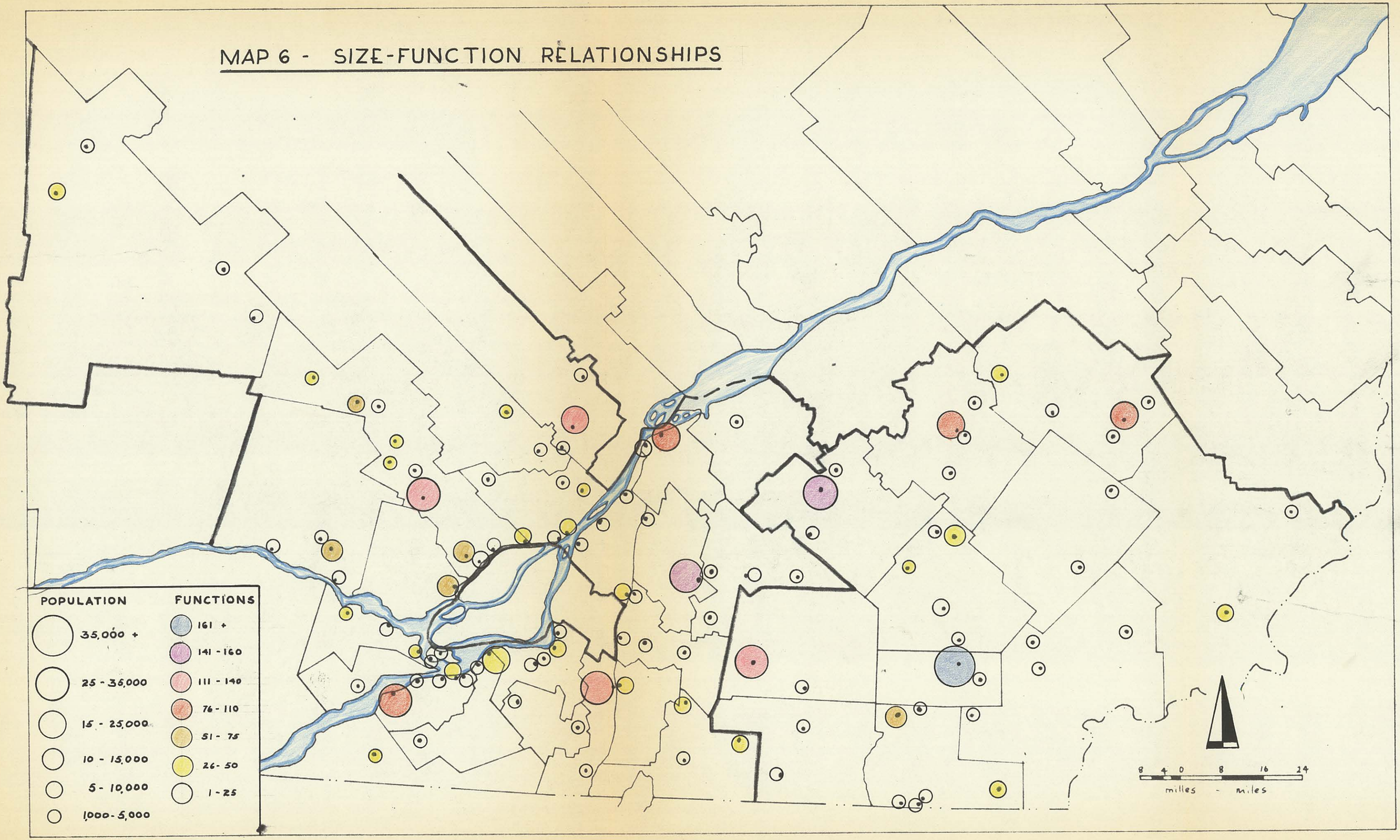
Class IV groups three localities of between 18 and 22,000 inhabitants and 76 to 90 functions. There are three centres in this category, Thetford Mines, Sorel and Victoriaville.

Below this level, it becomes difficult to read the graph and this is probably due to 1) the incomplete range of functions, and 2) to the presence of dormitory settlements at the periphery of the Montreal Metropolitan Area, which can have a large number of inhabitants but relatively few functions (such as Châteauguay for example).

GRAPH 5 - SIZE - FUNCTION RELATIONSHIP



MAP 6 - SIZE-FUNCTION RELATIONSHIPS



CHAPTER FIVE

SHOPPING

1. Unadjusted Index of Local Specialization

To classify the remaining centres we made an analysis of the shopping facilities in each centre.

Using the Unadjusted Index of Local Specialization, as devised by Mattila and Thompson* for industry, we measured the relative importance of the localities in the two Regions as shopping centres within the regional context.

The Index is expressed as follows:

$$\frac{Sc/Pc}{Sr/Pr}$$

where:
Sc = Shopping Receipts of the centre
Pc = Population of the centre
Sr = Total Shopping Receipts of the Region
Pr = Total Population of the Region

This Index also shows whether the value of shopping in a centre is superior or inferior to the regional average considering its size.

When the Index is one, we can infer that the stores in any locality just supply local needs. When the Index is above one, it implies that people come into the centre for their shopping, and below that they move away. Table 2 which lists the results of the calculations, appears at the end of this chapter.

There are five centres which have an Index of one (i.e. from 0.98 to 1.03): Disraeli, Hudson, Repentigny, Rawdon and St. Jacques. These localities have no shopping hinterland and people do their shopping in the centres.

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* Mattila, J.M. and Thompson, W.R. op. cit.

This analysis has given us another criterion on which to base our final classification.

2. Index of Surplus Shopping Receipts

The Index of Surplus Shopping Receipts, again devised by Mattila and Thompson* expresses directly or explicitly the imbalance or outbalance of trade in dollars by calculating the difference between the actual local shopping receipts and the locality's pro-rata share of the regional shopping receipts.

The formula is as follows:

$$Sc - \left(\frac{Sr}{Pr} \times Pc\right)$$

where: Sc = Shopping Receipts of the Centre
Sr = " " " Region
Pr = Population of the Region
Pc = " " " Centre

Table 2 at the end of this chapter, lists the results of this calculation for all the centres studied. The Index accords to each centre a weight in direct proportion to its size (local population), the absolute measure of surplus shopping reflects the relative size of the centre. In other words, the Index of the imbalance or outbalance of shopping indicates the importance of a locality relative to the importance of other centres to the same locality.

Two categories emerge from this calculation: they are those centres which have a surplus of shopping Receipts exceeding $30,000,000 (Sherbrooke) and those with a surplus of $6,000,000 to $30,000,000. In this last category we find eleven localities: St. Hyacinthe, Joliette, St. Jérôme, St. Jean, Valleyfield, Sorel,

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* Mattila, J.M. and Thompson, W.R. op. cit.

Lachute, Drummondville, Granby, Thetford Mines and Victoriaville. Classes I and II again are well defined, but no other groupings emerge from the figures.

TABLE 2

Centre	Unadjusted Index of Local Specialization	Surplus/Deficit of Shopping Receipts ($'000)
(Montreal Environs)	$\frac{Sc/Pc}{Sr/Pr}$	$Sc - \frac{Sr}{Pr} \times Pc$
St. Hyacinthe	1.81	16,789.7
Joliette	2.08	24,385.5
St.Jérôme	1.53	10,445.0
St. Jean	1.60	11,010.5
Valleyfield	1.40	7,577.1
Sorel	1.43	6,179.5
Ste. Agathe	1.83	3,251.1
Ste. Thérèse	1.18	1,477.2
Lachute	2.03	7,371.4
St. Eustache	1.32	2,789.8
Mont Laurier	2.10	4,418.7
Ste. Adèle	1.96	872.1
Châteauguay	0.70	-3,244.2
Beloeil	1.73	4,181.4
Iberville	0.94	-273.9
St. Sauveur	1.82	949.6
Laprairie	1.45	2,280.0
Dorion	1.85	2,917.1
Repentigny	1.03	206.5
Farnham	1.13	562.9

TABLE 2 (Continued)

Centre	Unadjusted Index of Local Specialization	Surplus/Deficit of Shopping Receipts ($'000)
(Montreal Environs)	$\frac{Sc/Pc}{Sr/Pr}$	$Sc - \frac{Sr}{Pr} \times Pc$
Beauharnois	1.30	1,798.9
St. Jovite	2.08	1,983.8
Rawdon	1.03	59.9
L'Assomption	2.40	4,234.9
Huntingdon	1.96	2,064.3
Terrebonne	1.35	1,483.3
Rigaud	2.55	2,098.7
Acton Vale	1.31	848.9
Bedford	1.52	1,016.1
Brossard	0.32	-1,736.1
St. Césaire	1.29	423.6
Marieville	1.22	583.4
Tracy	0.55	-2,462.7
Rosemere	2.39	5,837.1
Grenville	0.79	-188.2
St. Hilaire	0.82	-346.1
Varennes	0.63	-551.1
Ormstown	1.55	576.3
St. Rémi	2.21	1,876.5
Verchères	0.67	-396.2

TABLE 2 (Continued)

Centre	Unadjusted Index of Local Specialization	Surplus/Deficit of Shopping Receipts ($'000)
(Montreal Environs)	$\frac{Sc/Pc}{Sr/Pr}$	$Sc - \frac{Sr}{Pr} \times Pc$
Hudson	1.03	77.5
L'Annonciation	1.37	196.7
Pierreville	1.44	466.2
Laurentides	2.81	2,092.7
St. Félix	1.07	67.9
Labelle	1.55	461.3
Napierville	1.29	361.9
Brownsburg	0.59	-995.6
St. Andrew E.	0.83	-134.1
St. Jacques	0.98	-20.5
Ferme Neuve	1.22	296.9
L'Epiphanie	1.09	164.2
St. Denis	0.45	-380.3
Val David	1.45	347.5
Contrecoeur	0.78	-297.5
St. Pie	1.05	53.5
Candiac	1.97	695.1
Lacolle	1.76	620.9
Ste. Rosalie	4.46	2,956.3
Ile Perrot	0.91	-171.8

TABLE 2 (Continued)

Centre	Unadjusted Index of Local Specialization	Surplus/Deficit of Shopping Receipts ($'000)
(Montreal Environs)	$\frac{Sc/Pc}{Sr/Pr}$	$Sc - \frac{Sr}{Pr} \times Pc$
St. Timothée	0.33	-452.5
Bois des Filion	0.54	-764.4
Richelieu	1.23	256.4
Melocheville	0.19	-909.0
Delson	1.50	713.9
Pincourt	1.23	421.5
Côteau Station	0.25	-521.0
Shawbridge	0.47	-370.0
Maple Grove	0.75	-234.4
Charlemagne	0.59	-839.0
Crabtree	0.75	-216.7
Léry	0.31	-911.0
(Eastern Townships)		
Sherbrooke	1.69	32,253.0
Drummondville	1.58	12,228.1
Granby	1.31	7,005.1
Thetford Mines	1.50	7,642.9
Victoriaville	1.53	7,016.6
Magog	1.51	4,718.8

TABLE 2 (Continued)

Centre	Unadjusted Index of Local Specialization	Surplus/Deficit of Shopping Receipts ($'000)
(Eastern Townships	$\frac{Sc/Pc}{Sr/Pr}$	$Sc - \frac{Sr}{Pr} \times Pc$
Lac Mégantic	1.29	1,423.7
Coaticook	1.77	3,722.6
Plessisville	1.21	973.8
Asbestos	1.21	1,626.1
Cowansville	2.12	5,506.8
Richmond	1.37	1,049.2
Waterloo	1.72	2,290.1
Arthabaska	1.44	927.1
Windsor	0.93	-289.9
Lennoxville	1.28	740.9
Disraeli	1.01	23.4
East Angus	0.92	-256.9
Black Lake	0.57	-1,239.0
Warwick	1.09	170.3
Sutton	0.83	-205.2
Knowlton	1.45	440.0
Rock Island	1.10	122.3
Dauville	0.80	-335.8
Cookshire	1.51	510.1
Princeville	0.70	-644.2

TABLE 2 (Continued)

Centre	Unadjusted Index of Local Specialization	Surplus/Deficit of Shopping Receipts ($'000)
(Eastern Townships)	$\frac{Sc/Pc}{Sr/Pr}$	$Sc - \frac{Sr}{Pr} \times Pc$
Stanstead Plain	0.77	-175.7
Bromptonville	0.77	-419.7
St. Cyrille	1.38	307.7
Waterville	0.59	-374.8
La Guadeloupe	1.63	761.5
Weedon Centre	0.88	-119.0
Robertsonville	0.43	-456.3
St. Germain	2.38	977.2
Scotstown	0.72	-200.7
Beebe Plain	0.63	-346.7
Bernierville	0.28	-1,344.0
Omerville	0.24	-573.5

CHAPTER SIX

CLASSIFICATION

Having analysed the localities according to the various criteria, we then proceeded to the final classification.

Table 3 lists the categories of centres and gives the differentiating and accessory characteristics of each category. The centres by category appear on Table 4, while Map 7 illustrates the different classes. The two tables and the map appear at the end of this chapter.

1. Spatial Characteristics and Central-Place Functions

a) Class I - Regional Capital

There is only one centre in this category, Sherbrooke, which lies more or less in the centre of the Eastern Townships, at about 85 miles from downtown Montreal. It is linked to the latter by the Autoroute.

Sherbrooke possesses the largest number of functions of all the centres studied as well as the largest population.

There are no such centres in the Montreal Environs Region, because of the presence of Montreal itself.

b) Class II - Cities

There are ten centres in this category, four of which are located in the Eastern Townships and six in the Montreal Environs.

The Cities of the Eastern Townships are, from

North to South, Thetford Mines, Victoriaville, Drummondville and Granby. They lie in a semi-circle around Sherbrooke at respectively 56, 48, 46 and 40 miles from the Regional Capital, and at 32, 28 and 36 miles from each other.

The Cities in the Montreal Environs lie in a circle around Montreal. They are Sorel, St. Hyacinthe, St.Jean, Valleyfield, St. Jérôme and Joliette. Their distance from Montreal varies from 20 to 48 miles and they are located at respectively 28, 28, 44, 32 and 16 miles from each other.

These Cities,which are important service centres, are quite independent localities. They have a wide range of functions and a surplus in shopping receipts which exceeds $6,000,000. They also are important administrative centres, all of them having a Québec Provincial Police Office, nine having a Municipal Court, six being County Towns and seven Judicial Centres.

c) Class III - Towns

There are seven Towns, of which two lie in the Eastern Townships and five in the Montreal Environs.

Asbestos and Magog are at 24 and 16 miles respectively from Sherbrooke and they are at 36 miles from each other.

The five Towns in the Montreal Environs, Lachute, St. Eustache, Ste. Thérèse, Ste. Agathe and Mont Laurier, are located North of Metropolitan Montreal. Lachute is at some 40 miles from Montreal; St. Eustache and

Ste. Thérèse lie at the edge of the Metropolitan Area, while Ste. Agathe and Mont Laurier are respectively at 56 and 125 miles from the Metropolis. These last two centres were classified as Towns even though they have less than 10,000 inhabitants. Indeed, Mont Laurier possesses all the characteristics of a Town because of its remoteness from Montreal, plus the fact that it is the only important locality in a large area which it must provide with central-place functions. Ste. Agathe, because of the tourist trade and its large number of Hotels and Motels, was also classified as a Town.

These Towns have no important administrative functions, except Mont Laurier which is a Judicial Centre, a County Town and has a Québec Provincial Police Office. Ste. Thérèse and St. Eustache are dormitory settlements of Montreal. Asbestos has fewer functions than the other centres in this class and Lachute the smallest population.

d) Class IV - Small Towns

The next group of centres which emerged from our analysis consists of 15 settlements which we called Small Towns. There are four such centres in the Eastern Townships and eleven in the Montreal Environs. In the Eastern Townships they are located North, South and at the centre of the Region. In the Montreal Environs, there are 8 Small Towns located South of the St. Lawrence River and 3 to the

North.

Centres in this category can be considered as being in different stages of transition. Some are dormitory settlements (Repentigny, Terrebonne, Rosemere, Châteauguay, LaPrairie, Beloeil and Iberville), while others are old villages which are in the process of becoming more complex urban centres because of their remoteness (Lac Mégantic).

Most of the Small Towns have a fair range of central-place functions, except Repentigny, Tracy and Windsor which have limited functional variety.

e) Class V - Urban Villages

Of the 21 centres in this category, 5 are located in Eastern Townships and 16 in the Montreal Environs.

In the Eastern Townships they are distributed more or less evenly, at about 32 miles from each other.

In the Montreal Environs, the 16 Urban Villages are scattered all over the Region.

In the Eastern Townships, three of the Urban Villages, Waterloo, Richmond and Arthabaska, are County Towns and have 2 lawyers and 2 notaries. Arthabaska is a Judicial Centre. All have more than 2 doctors, more than 2 secondary schools, and at least one bank.

In the Montreal Environs, all the Urban Villages have at least one Secondary school,

one bank, one hotel or motel, one doctor, one notary. Four are County Towns, 13 have either a Chamber of Commerce or a Farmers' Club. Two centres have a large number of hotels and motels: they are St. Sauveur and Ste. Adèle. In St. Sauveur 22 of the total 38 functions are hotels and motels: and in Ste. Adèle there are 24 hotels and motels for 45 functions. These two Urban Villages can be called resort centres.

For both Regions, the Urban Villages are well organized localities.

f) Class VI - Villages

In Class VI we find a variety of settlements, which range from rural to dormitory centres, with some that are in transition from one type to another.

There are 56 Villages distributed in both Regions: 35 are in the Montreal Environs and 21 in the Eastern Townships.

In the Eastern Townships the 15 centres which have a shopping index inferior to one are in this category; and in the Montreal Environs, 17 of the 22 centres which had an index inferior to one are in this category.

The three centres which recorded a loss of population from 1951 to 1961 are located in the Eastern Townships and are classified as Villages.

2. Clases of Centres

Because of the arbitrary character of categories, it is

more important to consider the principle by which they are generated than the categories per se. As it was previously mentioned, categories and classification are just tools for manipulating empirical data. One is less intersted in getting each centre into its proper category than in showing concretely how the centres are differentiated in terms of central-place functions.

The only centre in Class I, Sherbrooke, is the most important locality of the two Regions, both for population and functions (excepting the Montreal Metropolitan Region.) It is a centre well served by administrative and central-place services. It has an important regional influence. Sherbrooke is the pole of attraction of the whole Eastern Townships. Even with the opening of the Autoroute, which links Sherbrooke to Montreal and will probably increase commuting, Sherbrooke is still growing and dominating its Region.

The centres in Class II are large and vigorous localities, possessing a mixture of well developed administrative functions and commercial facilities. They form an integral part of the urban system of the Province and cannot be considered as direct dependencies of Montreal. All these Cities are large commercial centres with increasing importance and vast hinterlands.* The centres have peripheral villages that are growing very rapidly.

The centres in Class III and IV form a mixture of independent settlements (Lac Mégantic, Mont Laurier) and dormitory

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* Leonard, M: Recherche des facteurs d'équilibre d'influence dans la plaine, entre Montréal et les six agglomérations, Thèse de Maitrise en Urbanisme, Université de Montréal, 1965.

towns (St. Eustache, Rosemere, Repentigny). Some are presently in transition from dormitory to more independent centres (St. Thérèse).

Classes V and VI group different types of centres. Some are old agricultural villages (Rigaud, Laurentides, St. Cyrille), others are ancient agricultural villages that are developing into more organized localities (Marieville, L'Assomption, Cookshire), while some are strictly dormitory settlements for Montreal (Léry, Bois des Filion).

3. Regional Systems

The principles of classification can be applied to the construction of regional systems. One of the purposes of this thesis being the better understanding of the urban systems in the Montreal Environs and Eastern Townships Regions, the results of the classification will now be used for comparing the two systems of town location and distribution.

- Location and Distribution of Classes of Centres

From a rapid examination of the Maps, one feature stands out: it is the concentration of localities around Montreal and the relatively scattered distribution of centres in the Eastern Townships. This phenomena is related strictly to urbanization. The Eastern Townships being a more agricultural region and the Montreal Environs being dominated by a Metropolitan Area, the phenomena is not extraordinary.

Topography is another disturbing factor in the lay-out of regional systems. In both of our Regions, there are no important localities in the areas of pronounced relief. We also notice a break in the distribution of settlements where the lowlands finish

and the uplands start.

The Eastern Townships, because of the absence of a metropolitan complex, have a more regular urban system. The Regional Capital, Sherbrooke, is surrounded by 4 Cities and 2 large Towns. The distance between these 6 centres and Sherbrooke, as well as the distance between each locality, is more or less uniform,except in the eastern part of the Region. Centres of the fourth class are lacking in the Region, where we find only four such centres. But localities of the fifth and sixth category are well distributed, surrounding and between the centres of higher rank. Again the eastern part of the Region is lacking in these classes of centres.

The urban system of the Montreal Environs Region is quite different. The most important reason for that difference is evidently the presence of Metropolitan Montreal. Other factors, associated with a metropolitan area, such as dormitory settlements, rapid urbanization and proliferation of adjacent localities, explain the great number and variety of centres surrounding the Metropolis. All the categories of centres are present. But when we leave the immediate vicinity of Montreal, the system of centres gets more discontinuous. There is a line of localities which goes up into the Laurentians, but the system is not complete. Indeed we find no centre above the third category in this area, with only a few fifth and sixth class localities between Ste. Agathe and Mont. Laurier.

MAP 7- CLASSES OF CENTRES

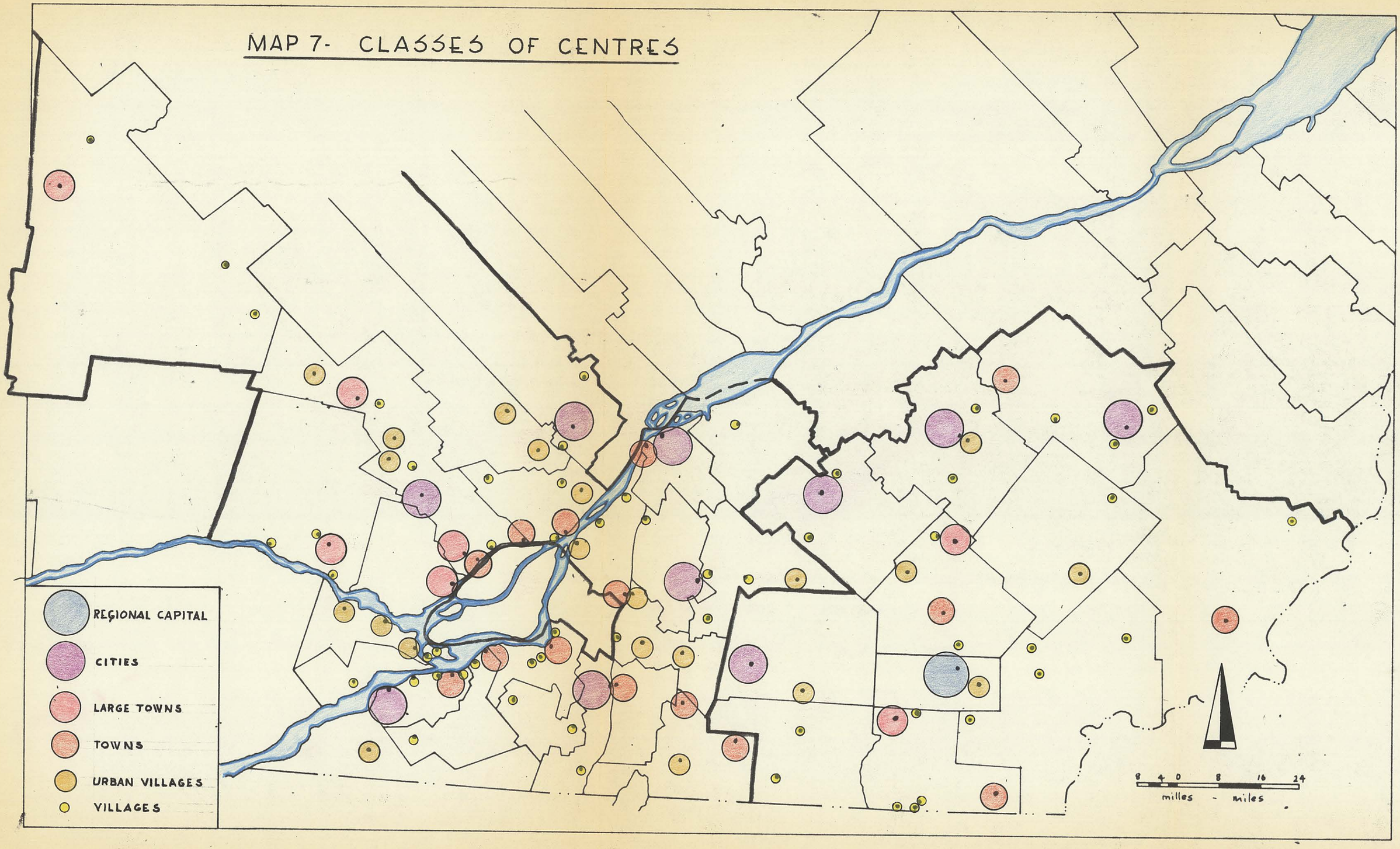

TABLE 3

Category	Differentiating Characteristics	Accessory Characteristics
Class I		
Regional Capital (1)	30,000+ Population 300+ Functions 500+ Stores $30,000,000+ Surplus Shopping Receipts	1+ Radio Station TV Station 15+ Banks 25+ Secondary Schools 10+ Vocational Schools 5 Colleges 2+ Public Libraries 5 Hospitals 100+ Doctors 25+ Dentists Archidiocesan Centre 20+ Catholic Churches 50+ Lawyers 20+ Notaries 1+ Daily Newspaper
Class II		
Cities (10)	15-35,000 Population 75-160 Functions 240-500 Stores $6,000,000-30,000,000 Surplus Shopping Receipts	Radio Station Quebec Provincial Police Office Bell Telephone Regional Office Hospital 16+ Doctors 8+ Lawyers Regional School Commission Registered Office 1+ Weekly Newspaper National Employment Service Office Agronome
Class III		
Towns (7)	10-15,000 Population 50-75 Functions 108-200 Stores	Weekly Newspaper Public Library 5+ Doctors 3+ Dentists 2+ Lawyers

TABLE 3 (Continued)

Category	Differentiating Characteristics	Accessory Characteristics
Class IV		
Small Towns (15)	5-10,000 Population 21-45 Functions 52-106 Stores	1+ Secondary School 2+ Doctors 2+ Notaries
Class V		
Urban Villages (21)	20+ Functions 20+ Stores and/or Shopping Index of 1	Population between 1,300-5,000
Class VI		
Villages (56)	Less than 20 functions Less than 20 stores	Population between 1,000-4,800

TABLE 4

CENTRES BY CATEGORIES

Class I	1 Centre	Characteristics
Regional Capital	Sherbrooke	35,000+ population 300+ Functions 500+ Stores $30,000,000+ Surplus Shopping Receipts

Class II	10 Centres	Characteristics
Cities	Granby St. Hyacinthe Drummondville St. Jérôme Valleyfield St. Jean Thetford Mines Sorel Victoriaville Joliette	15-35,000 Population 75-160 Functions 240-500 Stores $6,000,000-30,000,000 Surplus Shopping Receipts

Class III	7 Centres	Characteristics
Towns	St. Eustache Ste. Thérèse Lachute Ste. Agathe Mont Laurier Magog Asbestos	10-15,000 Population 50-75 Functions 108-200 Stores

Class IV	15 Centres	Characteristics
Small Towns	Châteauguay Repentigny Beauharnois Beloeil Tracy Iberville LaPrairie Cowansville Lac Mégantic Coaticook Plessisville Windsor Terrebonne Farnham Rosemere	5-10,000 Population 21-45 Functions 52-106 Stores

TABLE 4 (Continued)

Class V	21 Centres	Characteristics
Urban Villages	Waterloo Richmond Lennoxville Disraeli Arthabaska St. Jacques St. Jovite Rawdon Varennes St. Césaire Rigaud St. Sauveur Ste. Adèle Hudson Dorion L'Assomption Acton Vale Marieville Huntingdon St. Hilaire Bedford.	20+ Functions 20+ Stores and/or Shopping Index of 1

Class VI	56 Centres	Characteristics
Villages	Brossard Brownsburg Ile Perrot Charlemagne Pincourt L'Epiphanie Bois des Filion St. Rémi Delson Contrecoeur Ferme Neuve Léry Napierville Verchères Laurentides Melocheville Richelieu Pierreville Ormstown St. Pie Maple Grove St. Félix Grenville Crabtree St. Rosalie	Less than 20 Functions Less than 20 Stores

TABLE 4 (Continued)

Class VI	56 Centres	Characteristics
Villages	Labelle	
	Lacolle	
	St. Andrew East	
	Val David	
	St. Denis	
	Candiac	
	L'Annonciation	
	Shawbridge	
	Côteau Station	
	St. Timothée	
	East Angus	
	Black Lake	
	Princeville	
	Bromptonville	
	Bernierville	
	Danville	
	Warwick	
	Sutton	
	La Guadeloupe	
	Rock Island	
	Weedon Centre	
	Cookshire	
	Knowlton	
	Beebe Plain	
	Waterville	
	Robertsonville	
	St. Cyrille	
	Stanstead Plain	
	Omerville	
	Scotstown	
	St. Germain	

CHAPTER SEVEN

CONCLUSION

1. Concerning the Classification

> "The great value of a hierarchy of classes or regions is that generalizations may be made about the same objects of study at different levels of abstration, thus saving time in organizing and reorganizing similar material."*

As it was noted before, the multitude of studies and the variety of approaches to this field of urban geography tend to prove that, whatever the methodology the end result, the classification, is a valuable implement for the study of the location and distribution of urban communities.

Without accepting the results of this analysis as an unalterable and final classification of the localities in the two studied Regions, one could nevertheless, considering the criteria used, evaluate the results of this hierarchical classification.

2. Concerning Regional Planning

The knowledge of the spatial and functional distribution of centres in a region is important to decide the type of plan best suited for the region's future and the character of urban places located within it.

The differences between the two regional systems that have been analyzed seem to justify the existence of the two Regions. This does not mean that the two Regions will always remain as they are presently. Depending on the purpose of their use, the boundaries can change. This is shown by the recently formed Quebec Administrative Regions (Map 8).

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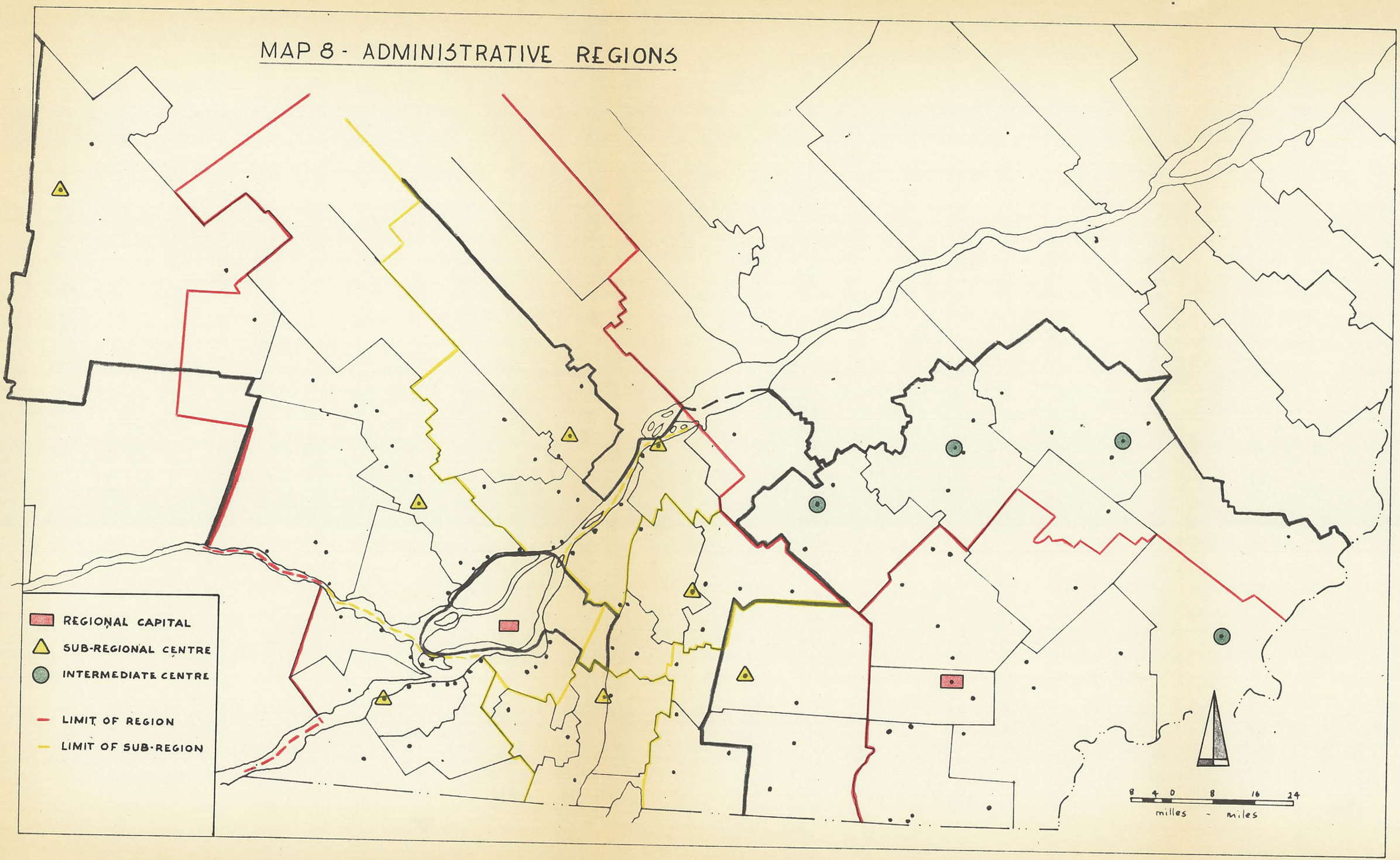
* GRIFF, D., Op.Cit. p. 489.

MAP 8 - ADMINISTRATIVE REGIONS



There are weaknesses in both systems but they could disappear with the aid of regional planning so that in the future these Regions could become well-balanced from the urban point of view.

Presently the urban system of the Montreal Environs Region is greatly influenced by the Metropolis. The urbanization of Montreal was too rapid for the surrounding localities to adapt themselves to this new phenomena. Disorder now reigns in the Region regarding the size, functions and distribution of the centres. An overall plan is required to keep the Region in balance, to re-distribute the functions in the different classes of centres and to form a regional system that is in accordance with the Metropolitan Area lying within. The centres themselves must get reorganized so as to be able to grow, and even to survive, some of them, in an orderly manner.

Regional planning is also necessary in the Eastern Townships although the problem is different from that of the Montreal Environs. Here, regional planning has to prepare the Region for future development. Although urbanization is not as advanced as in the Montreal Environs this does not mean that planning is unnecessary. On the contrary, a comprehensive plan for the Region could help avoid the disordered and unbalanced urban system of the Montreal Environs. Since the Eastern Townships Region is actually in the process of urbanization and will soon be fully developed, a regional plan is necessary to organize this development and to help keep the balance between the different classes of centres in the Region.

APPENDIX I

SOURCES OF INFORMATION

Agronomes Farmers' Club	Department of Agriculture (Québec)
Lawyers Notaries Municipal Courts	The Province of Québec Legal Telephone Directory, 1965-66
Banks Post Offices Judicial Districts County Towns Boards of Trade Railway Stations Newspapers Radio and Television Stations	Canadian Almanac, 1965
Public Libraries	Canadian Almanac, 1965 Québec Yearbook, 1963
National Employment Service (N.E.S.) Offices	Economic Geography of Canada (Camu, Weeks and Sametz, Toronto, 1964)
Québec Provincial Police Offices	Québec Provincial Police
Bell Telephone Offices	Bell Telephone Company
Head Office of Regional School Commission Secondary Schools Normal Schools Classical Colleges Specialized Schools	Department of Education (Québec)
Dentists	College of Dental Surgeons of the Province of Québec
Catholic Churches Diocesan Centres Archdiocese	Canada Ecclésiastique, 1964
Hospitals	D.B.S. 1964, Bulletin Sp.4
Hotels and Motels	Department of Tourism, Fish and Game, Québec
Doctors	Medical Handbook, 1964
Hydro-Québec Offices	Hydro-Québec

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APPENDIX · 2 · FUNCTION TABLE · (FOR SOURCES SEE APPENDIX · 1 ·)

COUNTY & REGION — ME: MONTREAL ENVIRONS. ET: EASTERN TOWNSHIPS.

CENTRE	COUNTY	REGION	POPULATION	PUBLIC ADMINISTRATION: JUDICIAL CENTRE	COUNTY TOWN	MUNICIPAL COURT	Q.P.P. OFFICE	TRANSPORTATION: RAILWAY STATION	COMMUNICATION: RADIO STATION	T.V. STATION	BELL TEL. OFFICE	POST OFFICE	ELECTRIC POWER: HYDRO-QUEBEC OFFICE	FINANCE: BANK	EDUCATION: REG. SCH. COMM. REGISTERED OFFICE	SECONDARY SCHOOL	VOCATIONAL SCHOOL	UNIVERSITY & COLLEGE	PUBLIC LIBRARY	HEALTH: HOSPITAL	DOCTOR	DENTIST	RELIGION: DIOCESAN CENTRE	CATHOLIC CHURCH	SERVICES TO BUSINESS MGT.: LAWYER	NOTARY	PERSONAL SERVICES: HOTEL & MOTEL	OTHERS: NEWSPAPER D	NEWSPAPER W	CHAMBER OF COMM.	FARMERS CLUB	N.E.S. OFFICE	AGRONOME	TOTAL	RETAIL STORES
SHERBROOKE	SHERB	ET	66,554	1	1	1	1	1	2	1	1	1		18	1	28	15	5	3	5	104	28	1	21	55	23	17	2	2	1		1	1	341	622
GRANBY	SHEFF	ET	31,463			1	1	1	1		1	1	2	7	1	11	4	2	2	2	26	8		8	15	10	14	1	2	1		1	1	123	341
ST. HYACINTHE	ST. HY.	ME	30,404	1	1	1	1	1	1		1	1	1	7	1	20	10	3	1	1	44	14	1	4	18	11	6		2	1	1	1	1	156	402
DRUMMONDVILLE	DRUM	ET	29,966		1	1	1	1	1		1	1	1	8	1	27	8	1	1	2	28	11		11	15	11	12		2	1		1	1	149	370
ST. JEROME	TERR	ME	29,107	1	1	1	1	1	1		1	1	1	10	1	12	2		2	1	33	7	1	5	15	8	10		3	1		1	1	122	397
VALLEYFIELD	BEAU	ME	27,297	1		1	1	1	1		1	1	1	7	1	8	4	1	1	1	23	9	1	9	14	7	6		3	1		1	1	106	300
ST. JEAN	ST. J.	ME	26,988	1	1	1	1	1	1		1	1	1	8	1	12	1	1	1	1	26	12	1	8	13	9	10		3	1	1	1	2	120	298
THETFORD MINES	MEG	ET	21,618	1			1	1	1		1	1	1	8	1	16	2	1		1	20	6		5	8	3	6		2	1	1	1	1	90	242
SOREL	RICHL	ME	20,735	1	1	1	1	1	1		1	1	1	6	1	9	4		1	3	19	3		5	13	7	3		3	1		1	1	89	307
VICTORIAVILLE	ART	ET	18,720			1	1	1	1		1	1	1	4	1	2	3	2	1	1	16	7		5	9	7	7		1	1		1	1	76	251
JOLIETTE	JOL	ME	18,088	1	1	1	1	1	1		1	1	1	4	1	17	5	1		2	33	10	1	7	16	8	5		3	1	1	1	1	126	272
CHATEAUGUAY	CHAT	ME	16,392			2		1				2		4	1	6					9	4		5	2	2	6		1					45	88
MAGOG	STAN	ET	13,139					1			1	1		3		7		1	2	1	16	5		3	4	3	12		1	1		1		63	173
ST. EUSTACHE	2 MTS	ME	12,737			2	1	1				2		3		3			2	2	12	5		3	5	9	2		1	1	1		1	56	108
STE. THERESE	TERR	ME	11,771			1		1				1	1	4		11		1	1	1	9	5		5	6	4	4		1	1		1		58	113
ASBESTOS	RICHM	ET	11,083			1						1		1		4		1	1	2	5	3		4	2	2	6		1	1		1		36	112
LACHUTE	ARG	ME	10,517		1		1	1				1	1	4	1	7			1	1	10	5		3	4	4	8		2	1		1	1	58	140
REPENTIGNY	L'ASS.	ME	9,139			1						1		1		1				1	9	2		1	3	2	12			1				35	55
BEAUHARNOIS	BEAU	ME	8,704		1	1		1				1	1	3		3			1		6	2		2	2	2	3				1	1		31	106
BELOEIL	VER	ME	8,358			1		1				2		4		6	1		1	1	8	3		3	4	3	4			1				43	80
TRACY	RICHL	ME	8,171											3		2					3	3		3	2	3	3							22	57
IBERVILLE	IBE	ME	7,588		1			1				1		2		8	1		1	1	11	2		3	2	3	3			1				41	77
LA PRAIRIE	LA. P.	ME	7,328		1	1	1	1				1		4	1	3					7	1		2	1	5	7			1				37	86
COWANSVILLE	MISS	ME	7,050				1	1				1	1	3	1	4			1		7	4		1	3	3	1							32	83
LAC MEGANTIC	FRON	ET	7,015			1	1	1			1	1		2		5	1		1	2	8	1		2	2	3	6		1		1	1	1	42	101
COATICOOK	STAN	ET	6,906			1		1				1	1	3		4	1		1	1	5	3		3	2	2	4		1		1		1	36	88
WINDSOR	RICHM	ET	6,589					1				1		2		3					2	3		2		2	6			1				23	76
PLESSISVILLE	MEG	ET	6,570			1		1				1		1		2	1	1	1	1	7	3		2	2	3	6		1	1			1	36	80
FARNHAM	MISS	ME	6,354			1		1				1	1	2		4			1		7	4		2	1	2	5			1		1		34	81
TERREBONNE	TERR.	ME	6,207			1		1				1		2		3	1		1	1	6			1	2	2	3		1	1				27	77
ROSEMERE	TERR	ME	6,158					1				1		3		2	1		1		2	2		1	2	1	1		1					19	52
MONT LAURIER	LAB	ME	5,859	1	1		1	1	1			1		2	1	2	1	1	1	1	11	1	1	2	3	4	6		1	1	1	1	1	49	116
STE. AGATHE	TERR	ME	5,725			1	1	1			1	1		4		3	1		1	3	8	3		2	5	3	24		1	1		1		65	99
DORION	VAUD	ME	4,996			1	1	1				1	1	2	1	1			1		3	2		2	3	2	11		1	1				35	51
EAST ANGUS	COMP	ET	4,756			1		1				1		1		2					3	2		2	2	1	2			1				19	42
WATERLOO	SHEFF	ET	4,543		1			1				1	1	2		4			1		5	2		1	2	2	3							26	79
L'ASSOMPTION	L'ASS	ME	4,448		1	1		1				1		2		2		1	1		3	4		1		2	3		1	1	1		1	27	62
BLACK LAKE	MEG	ET	4,180					1				1		2		3	2		1		2			1	2	1	2			1				19	40
RICHMOND	RICHM	ET	4,072		1	1	1	1				1	1	2		5			1		5	1		2	2	2	3			1			1	31	54
ACTON VALE	BAG	ME	3,957			1		1				1	1	1		2				1	4	3		1	1	2	3			1			1	24	53
MARIEVILLE	ROU	ME	3,809		1	1		1				1		1		4					2	1		1	1	4	2			1			1	22	54
BROSSARD	LA P.	ME	3,778									1		1								1		1			19			1				24	11
LENNOXVILLE	SHER	ET	3,699			1		1				1	1	2		2			1		7	1		1					1		1			20	37
BROWNSBURG	ARG	ME	3,617									1		2		3			1		2			1			3			1				14	33
HUDSON	VAUD	ME	3,211					2				2		2		2			1		3	2		1			1		1					17	21
PRINCEVILLE	ART	ME	3,174					1				1		1		2				1	2	1		1		1	3							14	44
HUNTINGDON	HUN	ME	3,134		1		1	1				1	1	2		4				1	3	2		1	1	3	2		1		1		1	27	60
ILE PERROT	VAUD	ME	3,106			1		1				1		1		1					1			2		1	2							11	40
DISRAELI	WOL	ET	3,079					1				1		1		2	1				2	1		1		1	5		1	1	1		1	20	51
CHARLEMAGNE	L'ASS.	ME	3,068					1				1									1			1						1				5	28
ARTHABASKA	ART	ET	2,977	1	1							1		1		4				1	6			1	2	2	3		1	1				25	40
ST. HILAIRE	ROU	ME	2,911			1		1				1		2		1			1	1	2	1		1	1	2	5							20	20
BEDFORD	MISS	ME	2,855		1			1				1	1	2		3				1	4	2		1	1	2	2			1			1	24	46
BROMPTONVILLE	RICHM	ET	2,726					1				1		1		4					3			1		1				1				13	18
BERNIERVILLE	MEG	ET	2,706																								1							1	18
ST. JOVITE	TERR	ME	2,692					1				1	1	3		2				1	3	1		1		2	11			1	1			29	50
PINCOURT	VAUD	ME	2,685			1						1		1							1	1		1			1							7	10
L'EPIPHANIE	L'ASS.	ME	2,663					1				1		1		1					3			1		2	1			1	1			13	44
DANVILLE	RICHM	ET	2,562					1				1		2		4					4			1			2			1				16	37
BOIS DES FILION	TERR	ME	2,499			1						1				1					2	1				1			1	1				9	21
WARWICK	ART	ET	2,487					1				1		2		2					4	1		1	1	1	4							18	32
RAWDON	MCLM	ME	2,388				1	1				1	1	2		4		1	1	1	2	1		1		1	8			1				27	26
ST. REMI	NAP	ME	2,276			1		1				1	1	1		3					4	1		1		2	1			1			1	19	48
VARENNES	VER	ME	2,240					1				1		3		2	1				3	1		1		2	3			1	1			20	21
ST. CESAIRE	ROU	ME	2,097			1		1				1	1	1		3	1		1		4			1		2	4			1				22	42
DELSON	LAP	ME	2,075			1		1				1		1		1								1			1							7	13
ST. JACQUES	MCLM	ME	2,038					1				1		1		3	1				1			1		1	1			1			1	13	31
CONTRECOEUR	VER	ME	2,007					1				1		2		1					1			2	2	1				1				12	29
RIGAUD	VAUD	ME	1,990			1		1				1		1		3	2	1	1		4	1		1		2	5		1	1				26	44
FERME NEUVE	LAB	ME	1,971									1		1		2					3			1		1	2			1	1			13	40
LERY	CHAT	ME	1,957									1												1										2	11
NAPIERVILLE	NAP	ME	1,812		1			1				1		1		4					1			1		1	3							14	35
VERCHERES	VER	ME	1,768		1			1				1		1		2					5			1		3	1			1			1	18	19
SUTTON	BRO	ET	1,755					1				1	1	1		3			1					1		1	7				1			10	23
LA GUADELOUPE	FRON	ET	1,728									1		2		1			1			1		1		1	4							12	22
ST. SAUVEUR	TERR	ME	1,702									1		2		1			1		3	1		1	1	2	22			1	1			37	27
LAURENTIDES	L'ASS	ME	1,698									1		1		2					4			1		2	2			1				14	32
MELOCHEVILLE	BEAU	ME	1,666									1				1			1					1			4							8	28
RICHELIEU	ROU	ME	1,612					1				1		2							1			1			1			1	1			9	14
ROCK ISLAND	STAN	ET	1,608					1				1	1	2		1			1		2	2		1	1	1	1		1					16	24
PIERREVILLE	YAM	ME	1,559					1				1		1		1					2	2		1		1	3				1		1	15	24
ORMSTOWN	CHAT	ME	1,527					1				1		1		1				1	8	1		1		1	2			1				19	33
ST. PIE	BAG	ME	1,434					1				1		2		1					3			1	1					1				11	22
WEEDON	WOL	ET	1,426				1	1				1				2					1			1			2			1	1			11	24
COOKSHIRE	COMP	ET	1,412		1		1	1				1	1	1		1					1			1		1	2				1		1	14	21
MAPLE GROVE	BEAU	ME	1,412									1												1			3							5	7
ST. FELIX	JOL	ME	1,399					1				1		2		3				1	2			1		1	2							14	32
KNOWLTON	BRO	ET	1,396		1			1				1	1	1		1			1		2	1		1		2	5							18	22
BEEBE PLAIN	STAN	ET	1,363									1		1							1			1			2			1				7	11
STE. ADELE	TERR	ME	1,331									1	1	3		1				1	5	3		1	2	1	24			1	1			45	37
WATERVILLE	COMP	ET	1,330					1				1	1	1		3			1		1			1			1				1			12	11
GRENVILLE	ARG	ME	1,330					1				1		1		3					2	1		1			8			1	1			20	15
CRABTREE	JOL	ME	1,313					1				1							1					1										4	13
STE. ROSALIE	BAG	ME	1,255					1				1		2		1								1			3				1		1	11	40
LABELLE	LAB	ME	1,224				1	1				1		1		3					1			1			3			1	1			14	28
LACOLLE	ST. J	ME	1,187				1	1				1		1		1					2			1			1			1	1			11	19
ST. ANDRE E.	ARG	ME	1,183					1				1		1		1					2	1		1			4			1				13	11
ROBERTSONVILLE	MEG	ET	1,156					1				1		1		2					1			1			2				1			10	17
ST. CYRILLE	DRUM	ET	1,138					1				1		1							3			1		2	2					1		12	21
VAL DAVID	TERR	ME	1,118					1				1												1			9							12	15
STANSTEAD PL.	STAN	ET	1,116				1	1				1				1		1			2			1			4			1				13	10
OMERVILLE	STAN	ET	1,094									1																						1	8
ST. DENIS	ST. HY	ME	1,063									1		1		4					2			1		1	1				1			12	11
CANDIAC	LA P.	ME	1,050			1						1		1		2					3	1		1									1	11	10
L'ANNONCIATION	LAB	ME	1,042					1						1		1				1	2	1		1	1	1	4				1			15	22
SCOTSTOWN	COMP	ET	1,038					1				1		1		2					1			1			1							8	12
SHAWBRIDGE	TERR	ME	1,034					1				1		1		1											1							5	6
COTEAU STA.	SOUL	ME	1,032					1				1		1										1			2							6	11
ST. GERMAIN	DRUM	ET	1,015					1				1		1		3					1			1							1			9	17
ST. THIMOTHEE	BEAU	ME	1,003					1				1				2					1			1			3				1			10	6