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[Aller au sommaire du numéro](#)

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THE UTILITY OF QUANTITATIVE SOURCES IN THE STUDY OF
TRANSPORTATION AND THE GROWTH OF ONTARIO AND
QUEBEC URBAN HIERARCHY, 1861-1901: AN EXAMPLE

A recent issue of *Urban History Review*¹ noted references for historians interested in the connection between the railroad and urban growth in Canada. Resources included the records of the Canadian National Railway and from various departments of transportation within the Canadian government in the 19th century.

Other sources for data on transport in Canadian history do abound. Burghardt's² study of the road network of the Niagara Peninsula from the late 18th to mid 19th century is a spectacular example. He tested a model devised by Taaffe, Morrill and Gould³ on the ideal stages of transport advance with the development of a nation. The research task made use of early maps, county atlases and documents from the archaeological section of the National Museum of Man. Local histories and descriptions of travels were also consulted. Finally, topographical maps and aerial photographs enabled him to examine the local landscape in considering what natural barriers could have hindered the construction of Indian trails, the forerunners of the early road system in Ontario.

Much remains to be accomplished in the study of the influence of transport and the growth of Canadian cities. Burghardt's research, while distinctive and a definite contribution to research in the formation of communities, offers a non-quantitative instance of the new historical work now emerging in this area. Those quantitative analysis are more easily interpreted by a perspective embraced by Lampard in several articles.⁴ This is rooted in demography and human ecology. The "ecological complex" leads the urban historian to define the city and the process of urbanization within a framework composed of "population, environment, technology and organization" as key variables. Urbanization and community structure are interpreted as the outcome of a changing balance between population and environment moderated by organization through an increasingly efficient technology.

This research reports on some on-going analyses of quantitative

materials collected on railroads and population and economic changes in 19th century North America. Materials included in this piece included material on railroad construction and population size for the principal centers in Quebec and Ontario between 1861 and 1901. The choice of Quebec and Ontario incorporates those regions in Canada most intertwined with the historical development of the United States.⁵ Three variables were chosen, mainly for brevity in analysis. The first, population size, when taken in the "ecological complex" is a good indicator of how successful a community has been with other communities in the adaptive process with both the natural and social environment. The implication of competition manifested in a system of cities has been most recently considered by the geographer, James Simmons.⁶ He attributes to transportation the properties of equilibrium building by either enabling the dominant communities to maintain control over lesser order places or to allow centers of slightly lesser dominance challenge the older, established cities for dominance.

Rail and water transport are the two styles of movement within the period of analysis. Water transport is defined as the location or site of a city. This can be represented by a canal, river or lake. Railways are represented by the number of railroad companies intersecting at the location. Both the transportation and population data came from several sources. Population counts were derived from the 1932 CANADA YEARBOOK⁷ from a table depicting the previous size of all communities in Canada in 1931 with a minimum of 5000 persons. Thus, the population size for 1871 to 1901 was obtained. COULTON'S GENERAL ATLAS⁸ provided the 1861 population data. A compilation by Bladen⁹ on railroads indicated when each segment of any railway was finished and what towns it connected. Compared to other sources of rail construction such as POOR'S RAILROAD MANUAL and the UNITED STATES CENSUS for 1880 and 1890, this was a distinct improvement for point to point data. Water transport sites were located from maps in de T. Glazebrook, HISTORY OF CANADIAN TRANSPORTATION.¹⁰ Fifty-six places in Ontario and Quebec became eligible for this analysis.

Two tables summarize the findings. In Table 1 an attempt is made to compare the average population of communities by the number of rail

connections. As most would suspect, the largest sized centers throughout the entire period possessed the most railways. The relationship is not linear. Centers with three rail lines in 1861 and 1871, for instance, had a slightly lower population than places with two rail lines. Similar examples appear for 1881, 1891 and 1901, although by 1901 the most linear relation in the smaller-sized places existed.

To observe how location on water, the previous dominant mode of transportation, influenced population size, the sample of places was divided into water and non-water sites. Population size by this dichotomy is shown in Table 2. Except in nine of thirty-four categories, the population in places on water routes exceeded non-water locales. Landlocked places, as one proceeded through the period, began to cut into the differential in size. In fact, places reporting one railroad in the last three decades had a larger population than water site towns. If one examines categories with an above average population size for each decade, it becomes evident that major Canadian cities by 1901 were created by water and maintained their dominance by extending a web of rail lines to smaller centers. Eight of the nine incidents where landlocked towns averaged a size larger than water access places, ranked under the average size for that decade. Railroads, one might suppose, may have been the decisive factor for population growth in the lesser sized niches in the urban hierarchy.

An attempt of this paper is to inform other interested urban historians of some of the possibilities of analysis of transportation using the approach designated as the "ecological complex". Clarification of other variables, notably migratory and immigration flows, socio-economic characteristics, industrial profile and occupation structure during this period by other interested scholars may prove to be fruitful.

David Marple

FOOTNOTES

1. Peter Gillis, "Manuscript Division: Resources for the Study of Urban History in the Public Archives of Canada", June 1972, *Urban History Review*, Ottawa, National Museum of Man, pp.6-7.
2. Andrew F. Burghardt, "The Origin and Development of the Road Network of the Niagara Peninsula, Ontario, 1770-1851", *Annals of the Association of American Geographers*, 59, September 1969, pp.417-440.
3. E.J. Taaffe, R.L. Morrill, P.R. Gould, "Transport Expansion in Underdeveloped Countries: A Comparative Analysis", *Geographical Review*, 53, 1963, pp.503-529.
4. See Eric E. Lampard, "American Historians and the Study of Urbanization", *American Historical Review*, October 1961, pp.49-61 and E.E. Lampard, "The Evolving System of Cities in the United States: Urbanization and Economic Development", pp.81-140 in H.S. Perloff and L. Wingo, Jr., editors, *Issues in Urban Economics*, Baltimore: Johns Hopkins Press, 1968.
5. See the Preface of L.S. Bourne and R.D. MacKinnon, *Urban Systems Development in Central Canada*, Toronto: University of Toronto Press, 1972.
6. James Simmons, "The Evolution of the Canadian Urban System", Conference on Historical Urbanization in North America, York University, January, 1973.
7. Dominion Bureau of Statistics, *Canada Yearbook for 1932*, Ottawa: Queen's Printer, 1932.
8. G.W. Coulton, *Coulton's General Atlas*, New York: G.W. and C.B. Coulton and Company, 1874.
9. M.L. Bladen, "Construction of Railways in Canada to Year 1885", pp.43-60, volume 5, 1932 and M.L. Bladen, "Construction of Railways in Canada: 1885 to 1931", pp.61-107, volume 7, 1934, University of Toronto Studies in History and Economics, Contributions to Canadian Economics.
10. G.P. de T. Glazebrook, *A History of Transportation in Canada*, Toronto: Ryerson Press, 1938.

TABLE I

Average Population Size by Number of Railroads
for 56 Places in Ontario and Quebec, 1861 to 1901

Number of Railways	Decade									
	1861	N	1871	N	1881	N	1891	N	1901	N
0	4476	29	4914	31	4482	21	4173	16	4780	13
1	3633	12	5115	13	3877	17	5938	14	6041	13
2	6500	7	7900	8	4670	6	6407	11	6723	11
3	4600	2	5990	2	22942	6	6315	5	9447	7
4	67300	2	87000	2	15400	4	21715	5	16035	6
5							39259	3	24733	2
6					125712	2			68840	1
8							181215	1	209892	1
9									59920	1
10							219616	1	328172	1
Average Size	6975	52	8357	56	11405	56	15695	56	19521	56

N - Number of Places.

TABLE 2

Average Population for Centers located on
Water and Non-water Sites, Ontario and Quebec, 1861 to 1901

Number Railways	1861	N	1871	N	1881	N	1891	N	1901	N
0 Nw	1875	10	2365	13	3670	10	4174	7	4462	6
0 W	5844	19	6754	18	5219	11	4156	9	5052	7
1 Nw	2820	5	3603	5	4557	7	6300	5	6565	4
1 W	4215	7	6060	8	3401	10	5736	9	5808	9
2 Nw	4825	4	5790	5	1563	2	4186	5	6737	5
2 W	8733	3	11417	3	6224	4	8258	6	6712	6
3 Nw	5000	1	6878	1	15674	2	6685	3	8283	4
3 W	4200	1	5102	1	26576	4	5760	2	10999	3
4 Nw					8313	3	17062	3	8821	3
4 W	67300	2	87000	2	36660	1	28695	2	23248	3
5 Nw							10537	1	24733	2
5 W							53620	2		
6 Nw										
6 W					125712	2			68840	1
8 Nw										
8 W							181215	1	209892	1
9 Nw										
9 W									59920	1
10 Nw										
10 W							219616	1	328172	1
Average Population	6975	52	8357	56	11405	56	15695	56	19521	56

N - Number of Places

Nw- Places located in Landlocked Situation

W - Places located on Water Site