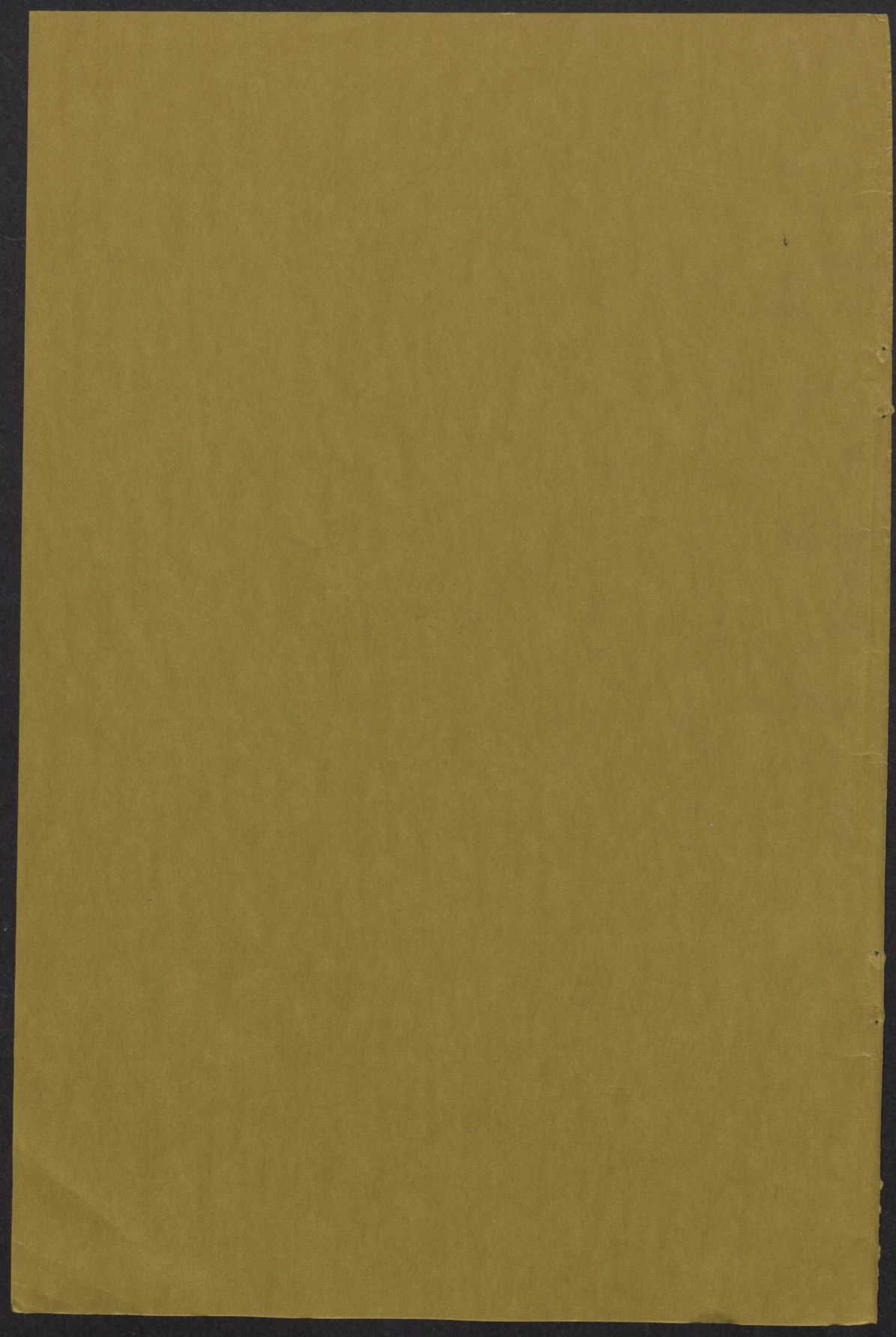# SMALL-AREA MIGRATION
EXPERIENCE
IN SOUTHERN ONTARIO
1951 TO 1961

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Small-Area Migration Experience
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PUBLIC POLICY AND MIGRATION[1]

In recent years there has been considerable academic and political discussion of such matters as: the costs and problems of large additions of population to the larger urban centers; the welfare and economic costs of low income areas; policies to facilitate adjustment of low income regions, such as concentrating public investment and subsidizing private investment in selected growth points; the impact of off-farm migration on rural service towns; and grandest of all, regional development and regional planning.

Much of this discussion has involved questions about individual rural localities and urban places or referred to towns of certain regions or certain types. For example, there has been acceptance of the concept that in many regions only a few of the towns possess the capability for continued growth and hence are viable focuses for development planning and investment.

These illustrations all involve some aspect or other of population flows into and out of individual areas, and especially the size and direction of the net migration stream of each planning unit. However, at least in Ontario there appears to have been little attempt to measure such flows. There has not been provided for the numerous government agencies and many local communities of Ontario a general perspective of the migration flows that affect them in all their planning decisions, particularly a perspective with small-area detail.[2]

A study of the changes in population size would reveal where extra persons have to be accommodated in communities, which is of value. However, net migration is of much more fundamental significance for economic planning because it is

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so much a reflection of economic opportunity. The implicit strategy of an economic plan must be based on knowledge of the shifting tides of fading or rising opportunity. Net migration is the indicator of the overall experience of people and firms in pursuing economic gain. While the magnitude of realized migration is usually too small compared to differential income opportunity, its sign is almost always correct. Hence it was believed that estimates of net migration would reveal which towns, localities, and regions were judged during the 1950's to have relatively or absolutely declining economic potential. By implicit assumption it perhaps was also believed that in the absence of major policy changes the 1950's would indicate the 1960's and even the 1970's.

The prime objective in our research was to construct migration estimates for as small geographic units as possible, that is, for individual townships and individual small towns as well as the larger urban places. The interests were mainly twofold: to mark those larger and smaller rural areas that were experiencing downward adjustment, and to see in what regions and in what individual towns there was evidence of significant urban growth through in-migration. The largest urban areas were of little interest as such because the direction and pace of migration was clear. However, to qualify that statement slightly, there was a hope that the study would provide measurements on a broad scale of the incidence around the largest cities of the still largely subliminal phenomenon of the dispersal of urban-oriented population across the rural countryside in a wide and increasingly dense blanket.

The use of very small geographic units provides a data resource which can be used by others to construct larger estimating units according to their particular research interests. For example, these data could be used to delineate the zones surrounding larger cities that are becoming rural dormitories. At the other extreme it should be possible to define entire regions of out-migration that do not have any urban growth points; such regions would represent particularly acute problems for stimulating economic activity and would require different approaches than in a depressed rural region that had several successful nodes.

In other words, it was believed that in many directions of policy and research there would be value in a close look at the overall migration surfaces of Southern Ontario. The objective in this study was modest in its simplicity but ambitious in its scope. Attention was limited to Southern Ontario because it was believed that the regional development problems and opportunities in the northern part were less thoroughly intermeshed in an inter-regional matrix of economic interdependency.

EDUCATION AND OUT-MIGRATION

A region which experiences continuing out-migration is a region of relatively low income and slow growth. People move to gain greater economic opportunity. The most mobile people are 15 to 25 years of age, especially those who have just left school.[3]

There is a harsh economic dilemma, not yet fully solved, facing any area which experiences prolonged out-migration. It pays the expenses of educating young people, who almost immediately migrate to another region, and who make their economic contribution in that other region. The receiving region bears none of the

direct education costs and receives the direct benefits. The out-migration area has restricted private and public resources for education, but at the same time, it should not reduce its education program because that policy would soon lead to reduced out-migration and even lower incomes in the area.

An area of out-migration benefits in a number of indirect ways if its migrants are readily employable. Education tends to improve employability, especially if it is designed to meet the labor needs of the resources and industries in the depressed area and in the regions to which migrants move. Employable people can migrate more readily, providing a better and faster adjustment in the labor market in the area they leave. A firm labor market will tend to create better incomes for those who stay. Good employability makes a happy migrant, and a happy ex-resident is a good advertiser for his old home-town. A firm labor market, good labor, ex-residents who have succeeded elsewhere, and appropriate labor training will help to attract industries and new activities. With a good education program, the people who stay in the region and know its resources will be better able to use those resources more fully and bring the area closer to its potential development.

The usual North American experience is that a region with slow economic growth is a low-income region, because of unemployment, under-employment, and/or low wage rates. Theoretically this need not be so; education policy and inter-government fiscal policy could do much to assure that people who remain in a slow-growth region "can enjoy like income for like work."[4]

VALUE OF SMALL-AREA ESTIMATES

An education system which is designed to meet the needs of a region will involve decisions on (a) types of program, (b) types of facility, (c) size of facilities, and (d) location of facilities. The system will involve primary, secondary, and post-secondary programs, both academic and technical. Large capital expenditures for "fixed plant" are involved. Flexibility over time is required for both programs and facilities. The location of each component is a crucial decision because it determines ease of access for students and staff, and costs of transportation whether public or private, for a number of decades.

In a region or locality with rapidly rising population and economic activity, planning such a system is made easier and errors are less expensive because of the maneuverability provided by growth. However, in a region with out-migration, low incomes, and slow growth, the planning problem is more difficult. There is less chance to correct past investment decisions while making new decisions because investments are less frequent.

Increasingly complex education systems and larger administrative regions make possible more sophisticated programs and more sophisticated analysis for decision-making. At the same time, decision-makers are becoming more remote from the small neighborhood, and have less "feel" for local circumstances. It is no longer possible to judge school building and equipment decisions by the "seat of one's pants" and the consensus of "how the neighborhood is going." Measurements and projections are required. However, even though school administration is at the county level, county averages are often useless. No county is homogeneous with respect to population change; consequently, needs for types, amounts, and loca-

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tions of school facilities also vary. County data mask very great differences in migration, both as to degree and sign of population flows.

In almost every kind of measurement made in this research, there was strong variation among townships and among towns within a county. It is hazardous, if not wrong, to classify counties as to type of migration experience.

If migration means anything for education planning, then each county school system must be prepared for a wide variety of circumstances within its borders. Boards and staff must be prepared to understand a wide range of problems, and to sense changes over time. Migration is a phenomenon of time, and its dynamic effects on school populations are spatially complex.

DATA, METHODS, AND LIMITATIONS

The estimates which are represented in tables and maps in this paper cannot be properly assessed or understood without an explanation of the methods used. To estimate net migration, the vital statistics method was used, in which actual or assumed natural increase is added to the base population; if the actual terminal population exceeds that estimated level, the excess is considered net in-migration and vice versa for net out-migration.

The first stage of analysis dealt with entire counties and with incorporated urban places for which there are published data on births by residence of mother and deaths by residence.[5] In this way a direct measurement of the 1951–61 rate of natural increase was made for each county, for each incorporated urban place in the county which had a population over 1,000 for a substantial portion of that decade, and for the "rural" remainder of each county. Birth and death data for a number of townships adjacent to major cities enabled a direct measurement of the rate of natural increase for a whole "metropolitan area" in 10 cases. For a number of other cities reporting major annexations during the decade, the 1951 population and yearly births and deaths were adjusted in an attempt to allow for the annexed population. For each county or district there was calculated a rural rate of natural increase and a weighted rate of natural increase for all urban population in the county or district.

The second stage was at the township level. In each township, every incorporated town or village had its net migration estimated, using either its own rate of natural increase or the average urban rate for the county. The remaining population in the township was divided between population on census farms (adjusted for change between 1951 and 1961 in census definition of farms) and rural nonfarm population. Net farm migration was estimated by using the county average rural rate of natural increase. The rural nonfarm migration estimate was based on the county urban rate of natural increase or some weighted average of the urban and rural rates depending on a judgment of the local situation.

The estimates generated suffer from the general limitation of the vital statistics method. This method inherently underestimates the algebraic number of actual migrants (movers); if there is in-migration it is underestimated and if there is out-migration the outflow is exaggerated.[6] This arises because the data do not distinguish a birth (death) of the original population from a birth (death) of a

migrant after he has moved. The error is proportionate to the absolute rate of migration. In the case of the individual urban places and county rural remainder for which there were measured births and deaths, the direction of the bias of the method is known, although its size can be only roughly inferred from the size of the rate of estimated migration.

The estimated migration at the township level is subject to the same kind of error, but in these cases is not predictable in either sign or magnitude. Within the county the county average rate of natural increase was used, but each area had its own true (unknown) rate of natural increase. Each township varies in its characteristics of age, settlement pattern, income, and other demographic variables, for which no allowance can be made. If the assumed rate of natural increase was too high, out-migration is exaggerated or in-migration is underestimated, and vice versa. The sum of the small-area estimates of migration in each county do not agree with the census estimate for the county even allowing for the boundary modifications used in this analysis, because the overall weighting in our calculations of the rural and urban rates of natural increase will only accidentally equal the actual weighting. However, the estimation errors appear to be acceptably small for present purposes and in many cases are negligible.

Had there been available more complete and reliable indicators of the variation in rates of natural increase among populations in different settlement patterns, the estimates could have been improved by adjusting the rates of natural increase to recognize differences between such groups as central city, new suburbs, new open-country residents, and traditional rural nonfarm population.

The estimates are more valuable for portraying broad patterns, which was the main objective, than they are for elaborating on minute variations, for which they may be too inaccurate. For these reasons, the estimates are mapped and tabulated by broad ranges. On the maps certain municipalities appear to be exceptions to general regional patterns; such isolated variations should not be given too much weight.

In Map 4, the migration experience of urban *points* is blended with the migration of the surrounding rural township unit, and the data are presented as areal *blocks*. This has strong justification on the grounds that "urban" areas no longer have neat visible boundaries but spill out over the countryside like ripples from a stone dropped in calm water. This blocking-in approach to mapping on the scale of township units is appropriate in the vicinity of large urban places. However, with small places in sparsely populated regions, the township block may be so large as to give a visual exaggeration of the spatial extent of the migration phenomenon. This is especially true on Map 4 in the counties and districts on the Precambrian Shield, where there is further exaggeration due to the fact that unorganized (largely unpopulated) townships are combined in the census with adjacent townships. Such groupings are indicated by the omission of township boundaries within a number of shaded areas, and can be checked by comparing Map 4 with the base map in the Appendix (Map 5).

The part of Ontario examined in this study includes the 47 counties and districts that lie south of the French River and Lake Nipissing, including the districts

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of Manitoulin and Nipissing. These two districts are part of the Northeastern Ontario economic region. The remaining 45 counties and districts are grouped in the tables into eight economic regions as recognized by the Ontario government.

Within these counties and districts there are 436 rural townships outside metropolitan areas. There are estimates for 273 urban places. All the estimates are combined in Map 4, which displays the migration surface of Southern Ontario, identifying areas of net in-migration, and distinguishes two types of net out-migration: where the farm out-migration more than offset the in-migration of urban and rural nonfarm population and where there was urban plus rural nonfarm out-migration as well as farm out-migration.

PERSPECTIVE ON RURAL MIGRATION

The general tide of migration into urban centers is such a part of our current world that we easily accept it, and we explain it quite casually (and fairly safely) in terms of movement to higher income opportunities. We generally attribute variations in the growth rates of cities to differences in industrial growth; unfortunately, we rarely pause to query further. Without doubt, the human motivations behind individual decisions to migrate city-ward do tend to have a general and fairly simple pattern.

On the other hand, there is a far more complex set of considerations in the mind of the farm person when he ponders *whether* to migrate, if at all. It is harder to explain variations in out-migration than to explain why a city receives in-migrants. Rural migration patterns as a whole are difficult to explain because of the many varied components in the rural population, and their quite different economic, social, and psychological circumstances.

Throughout most of Southern Ontario there is one major population component which displays a consistent migration behavior, at least with respect to sign, though not with respect to rate of migration. This one relatively uniform component is the rural farm population, which everywhere shows out-migration. Within the rural nonfarm component there are several subgroups, widely differing in character. One "standard" subgroup is the population which services the farm industry and its population. This part of the rural nonfarm population exists in almost all areas but cannot be identified separately from other rural nonfarm groups. The trend of economic opportunity and hence migration of this group is closely tied to the varying trends of competitive performance in each farming region, and also to the changing economics of the demand for and supply of goods and services (including food processing) to agriculture.

A second major component of the rural nonfarm population may be located in towns and villages, near such communities, or scattered in a dispersed pattern across the open countryside. This component can be called the dispersed-urban population, being essentially a commuting labor supply to large cities. Within this group there are persons who were formerly engaged in farming or other rural activities but who have changed to an urban job without changing residence; and in increasing numbers there are persons who have moved into rural areas for a particular residential and community environment. Clearly the migration flows of these rural nonfarm urban-oriented people are influenced by the changes in eco-

nomic opportunity in urban areas within commuting range. This urban-oriented group is likely to be younger and its members may have higher incomes than the "standard" rural nonfarm population that services agriculture; hence the group may have different demographic and migration characteristics from the group which services the farm industry and its population.

There are additional types of rural nonfarm population that are significant in some areas, and whose migration behavior is influenced by yet other sets of factors. These are the groups that are primarily related to natural resource activities such as outdoor recreation, forest industries, and mining, or to special installations such as the nuclear scientific establishments. These groups are heterogenous and their occurrence tends to be sporadic within the space economy.

Although it is easy to define subgroups within the rural population such as those described in the preceding paragraphs, it proved impossible to measure them separately except for the population on farms. However, it is possible to make some inferences about the behavior of these subgroups by relating general knowledge of the provincial economic geography to the small-area data. Although the entire rural nonfarm population was treated as homogenous, the data have two important qualifications which make the procedures better than appears at first glance. First, the usual definition of "urban" was extended to include every incorporated town or village regardless of size, so that rural nonfarm here includes only those people whose immediate local government is the township. Secondly, the rural population was effectively segmented, if only in a spatial sense, by the use of small areal units (townships).

One of the great difficulties in careful investigation of migration in rural areas is the complete lack of data on differential demographic characteristics, where there are clearly large variations to be expected in rates of natural increase for rural groups. This information is needed particularly to measure the incidence of urban dispersal throughout the more remote urban fringe or shadow beyond the built-up suburbs. The discovery of this vacuum in our knowledge was one of the more striking findings in this project. At the time the project was begun in 1966, the closest approximation to the necessary information were the recent estimates for all Canada of the 1951–61 rates of natural increase of the rural farm and rural nonfarm populations.[7] These estimates were clearly defective for our purposes; they could be used only for preliminary exploration.

FARM MIGRATION

Despite the fact that there was estimated to be rural farm out-migration in every township of Southern Ontario during the decade, there was little homogeneity. Explanation of the variations in these estimates would require elaborate study of a number of variables operating within agriculture, such as technological and market changes, and study of regional factors such as soils, nearness of alternative employment opportunities, income levels, the psychology of poverty, and the social structures and attitudes of rural areas. Agriculture is not homogenous technologically or economically, and farming areas have varying spatial relations with the rest of the economy.

It can be seen in Map 1 that the rate of out-migration (as a percentage of 1951

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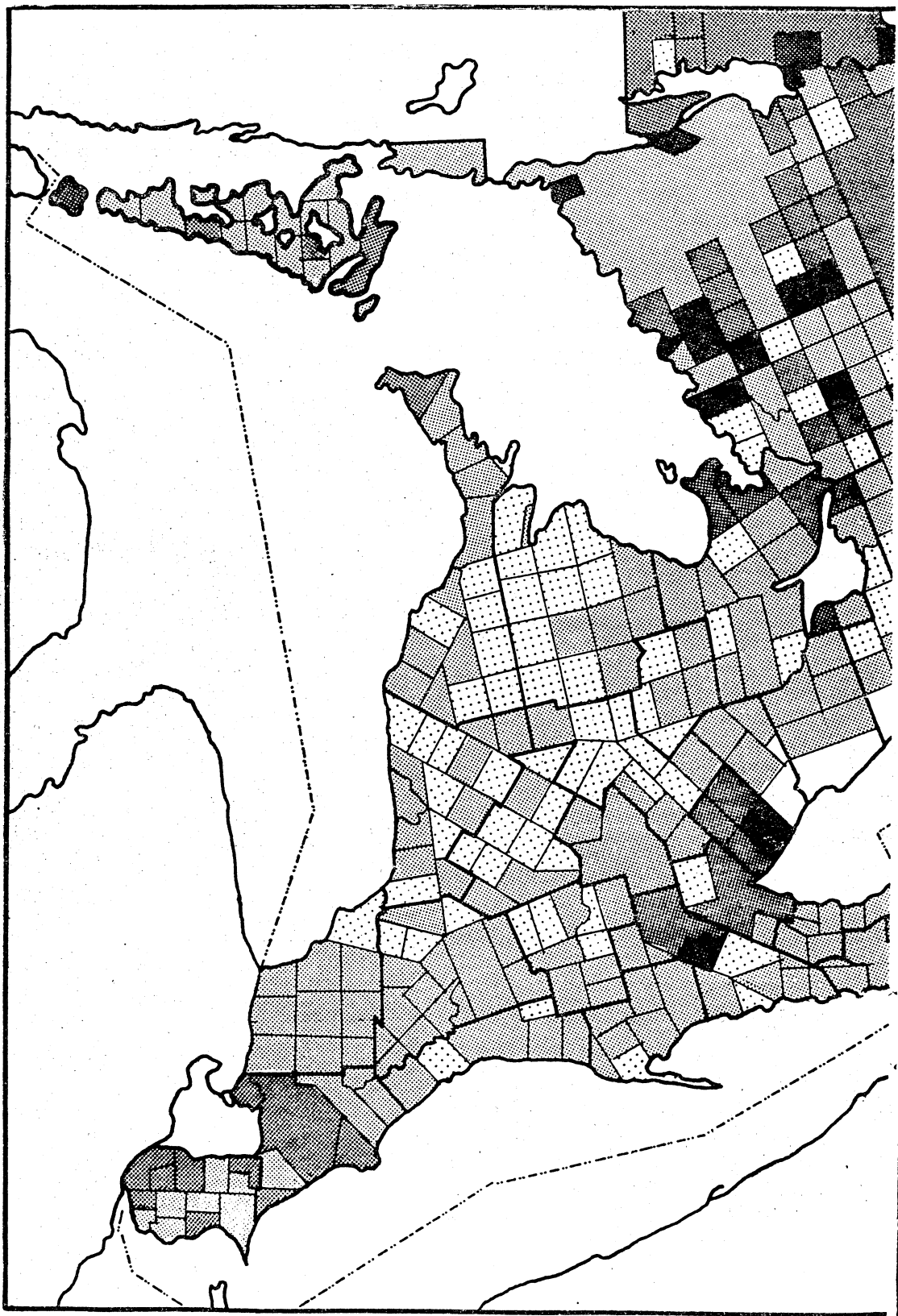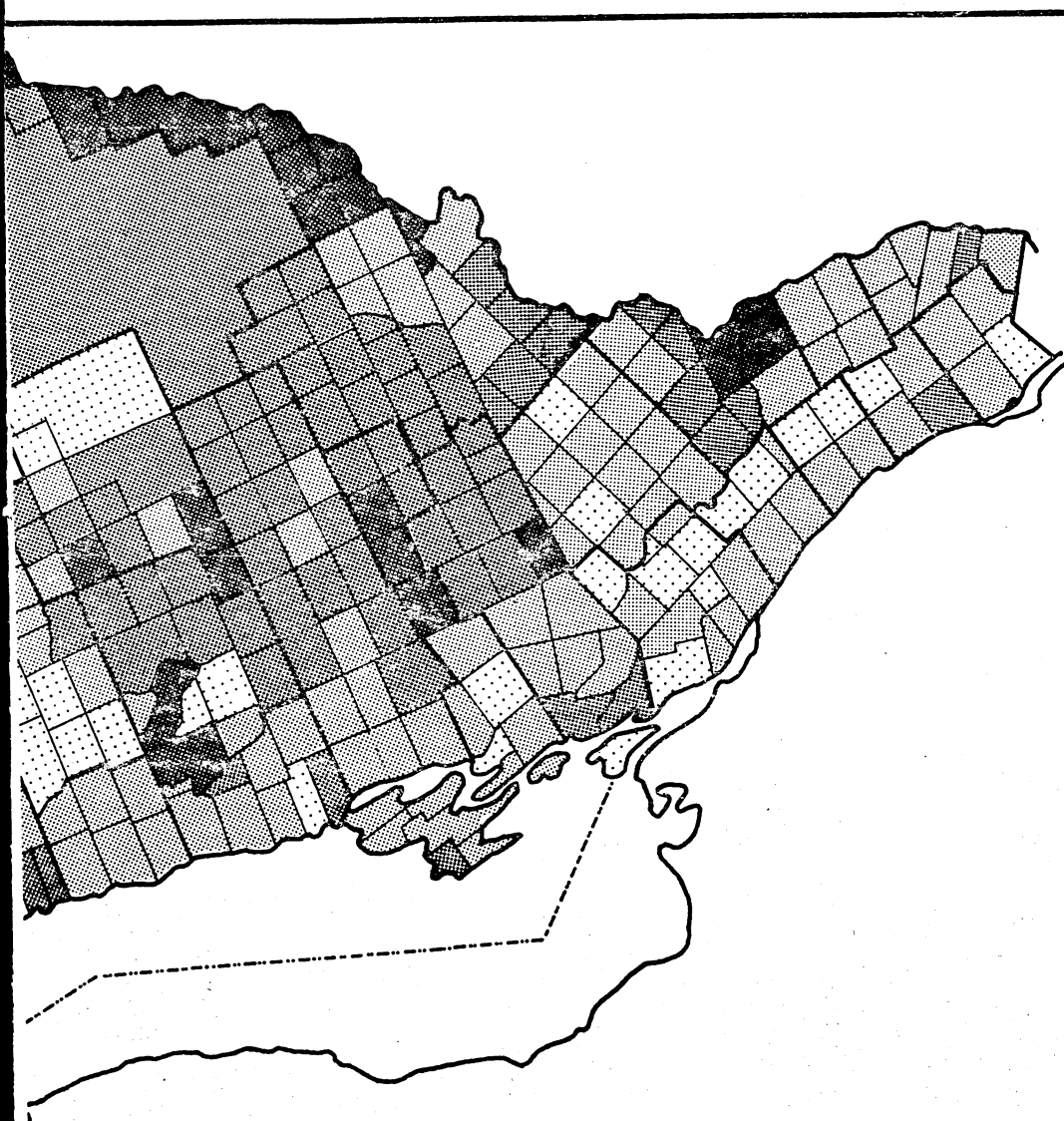
0 — 25	per cent
25 — 50	per cent
50 — 75	per cent
75 plus	per cent

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Department of
Agricultural Economics | RATE OF NET FARM OUT—MIGRATION
BY TOWNSHIP 1951—1961 | MAP
1 |

population[8]) approached 100% in a few areas, which meant that the population remaining on farms in 1961 was not much greater than the size of natural increase. The highest rates of out-migration occurred on the Precambrian Shield, where farm settlement was sparse and farming in general was submarginal. Heavy out-migration was found in Essex, Kent, Brant, Wentworth, Halton, and Carleton counties. Thus we found out-migration both (1) in regions where farm incomes were low and alternative income sources were scarce, and (2) in regions where farm incomes were relatively high and there were plentiful opportunities for even better incomes. The most prosperous farming areas, in the southwest, had moderately high rates in the 25%–50% range. In these counties there had been good adjustment on farms to new markets and technology (generally releasing labor) and there were good off-farm opportunities in nearby urban centers. The same moderate (25%–50%) rates were found along Lake Ontario and in Eastern Ontario where the farm incomes were much lower but the off-farm employment opportunities were fewer. For each region there were particular explanations and combinations of variables affecting the rate.

The most modest rates of farm migration are not found in the richest farming areas. The greatest concentration of townships in the 0–25% range is in the counties north of London-Kitchener-Barrie. Here the soils and climate are relatively favorable to a fairly broad range of products; also there are relatively few opportunities for full-time work outside agriculture but there are possibilities for part-time employment while continuing to farm.

Some farming adjusts to technology, prices, and markets by using land more intensively (e.g., shifting from grain growing to horticulture or fluid milk, in which more labor will be used per acre). In other areas the forces produce extreme mechanization and much larger land units per farm, with much reduced demand for labor per acre.

In Map 2, the number of farm migrants is related to an adjusted measure of the land resource used in 1951, by the ratio of migrants per 1,000 adjusted acres of farm land.[9] The regional pattern in Map 2 is rather similar to the pattern of migration rates (ratio of migrants to 1951 population) in Map 1, with relatively heavy migration per acre in much of the Precambrian Shield area, in the counties around the western end of Lake Ontario, and in Essex County; and with light migration in a large area south of Georgian Bay and a small area east of Lake Simcoe.

Related data are provided in Tables 1, A1, and A4. The 1951 farm population per adjusted acre is correlated with the farm migration per adjusted acre, both by county and by region. It would be plausible, on naive grounds at least, to argue that an area with a low level of base population per acre could not release as many migrants per acre as an area which started with a high population per acre; and in fact this is the finding. However, even given both that correlation and the definitional fact that the migration rate equals the ratio of farm migrants per 1,000 adjusted acres to 1951 farm population per 1,000 adjusted acres, there are no *a priori* grounds to expect that the migration rate will be correlated with the other two items. The migration rate does appear partly correlated with the other items in some areas, but there are significant discrepancies arising from the complex interactions among technical, social, and economic factors within agriculture.

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Table 1 FARM LAND AND POPULATION (1951) AND MIGRATION (1951–61), BY REGION

	Share of total Southern Ontario			*1951 farm population per 1,000 adjusted acres*	*Farm migrants per 1,000 adjusted acres*	*Farm migration rate[c] (%)*
Region[a]	Adjusted farm acres[b] 1951 (%)	Farm population 1951 (%)	Farm migrants 1951–61 (%)			
Lake St. Clair	10.70	11.9	13.7	57.1	25.7	45.0
Lake Erie	12.16	12.7	10.3	53.5	16.9	31.5
Niagara	7.02	11.2	12.7	82.0	36.2	44.2
Midwestern	14.59	11.8	7.9	40.9	10.9	26.6
Georgian Bay	16.40	13.7	11.4	42.8	13.9	32.4
Metropolitan	7.04	6.1	7.5	44.6	21.4	48.0
Lake Ontario	12.44	12.4	14.1	51.1	22.7	44.5
Eastern	18.17	18.2	19.7	51.4	21.7	42.2
St. Lawrence	8.27	8.3	7.7	51.7	18.7	36.1
Ottawa	9.90	9.9	12.0	51.2	24.3	47.4
Northeastern (part)	1.48	2.0	2.7	70.9	35.9	50.6
Southern Ontario	100.0	100.0	100.0	51.3	20.0	39.1

Note: Although there are six columns there are only three data items: land resource and farm population in 1951 and migrants between 1951 and 1961. The percentage distributions of the Southern Ontario totals, and the several ratios are shown simply to give a few perspectives on the migration patterns. The migration rate is the ratio of the preceding two columns, by definition, being the number of 1951–61 net farm migrants as a percentage of the 1951 population.

[a]See Table A1 for these data by counties.

[b]The adjusted farm acres are equal to improved land acreage plus one-tenth of the unimproved pasture acreage, in all census farm units.

[c]See Tables 2 and A2 for the number of farm out-migrants.

Some of the areas with low migration rates and low migration per acre started in 1951 with low farm population per acre, and at the same time could make the least radical adjustments in choice of farm products and in production methods. They also have weak pull from urbanization and suburbanization. On the other hand, Essex and Kent have undergone enormous mechanization, and the Niagara to Halton crescent has undergone very substantial land conversion to urban use. High migration rates are to be seen in a list of counties that includes the most intensive and also the least intensive agriculture, and very prosperous as well as submarginal areas.
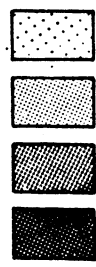
URBAN AND RURAL NONFARM PATTERNS

No longer is it reasonable to think of the "urban" population as those people living in densely built-up areas nicely encircled by a city boundary, and represented by a dot on a map. While it is true that for many conceptual purposes and analytical problems we may treat urban places as punctiform, there are major limitations to this cavalier approach when we wish to examine the settlement patterns of urban
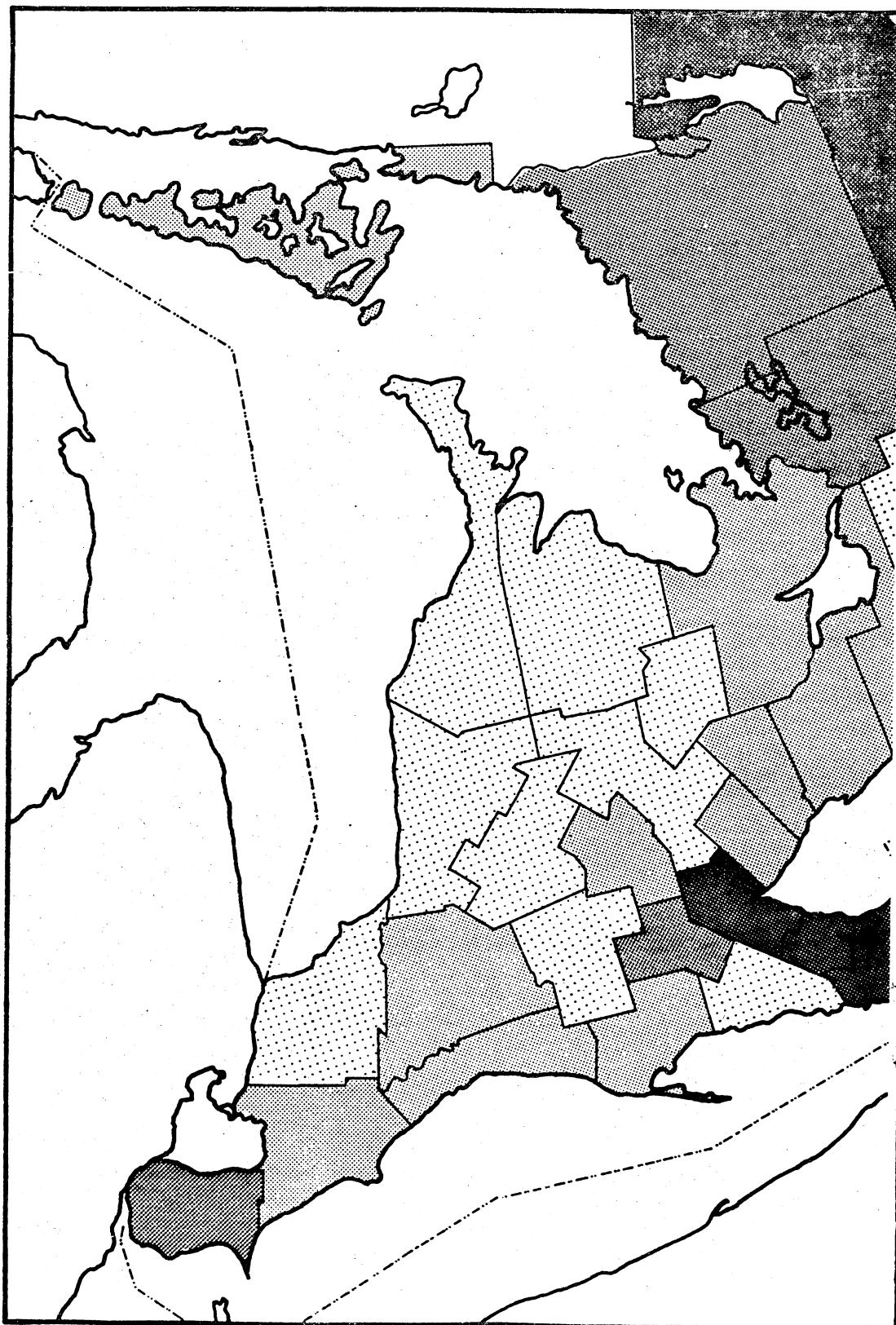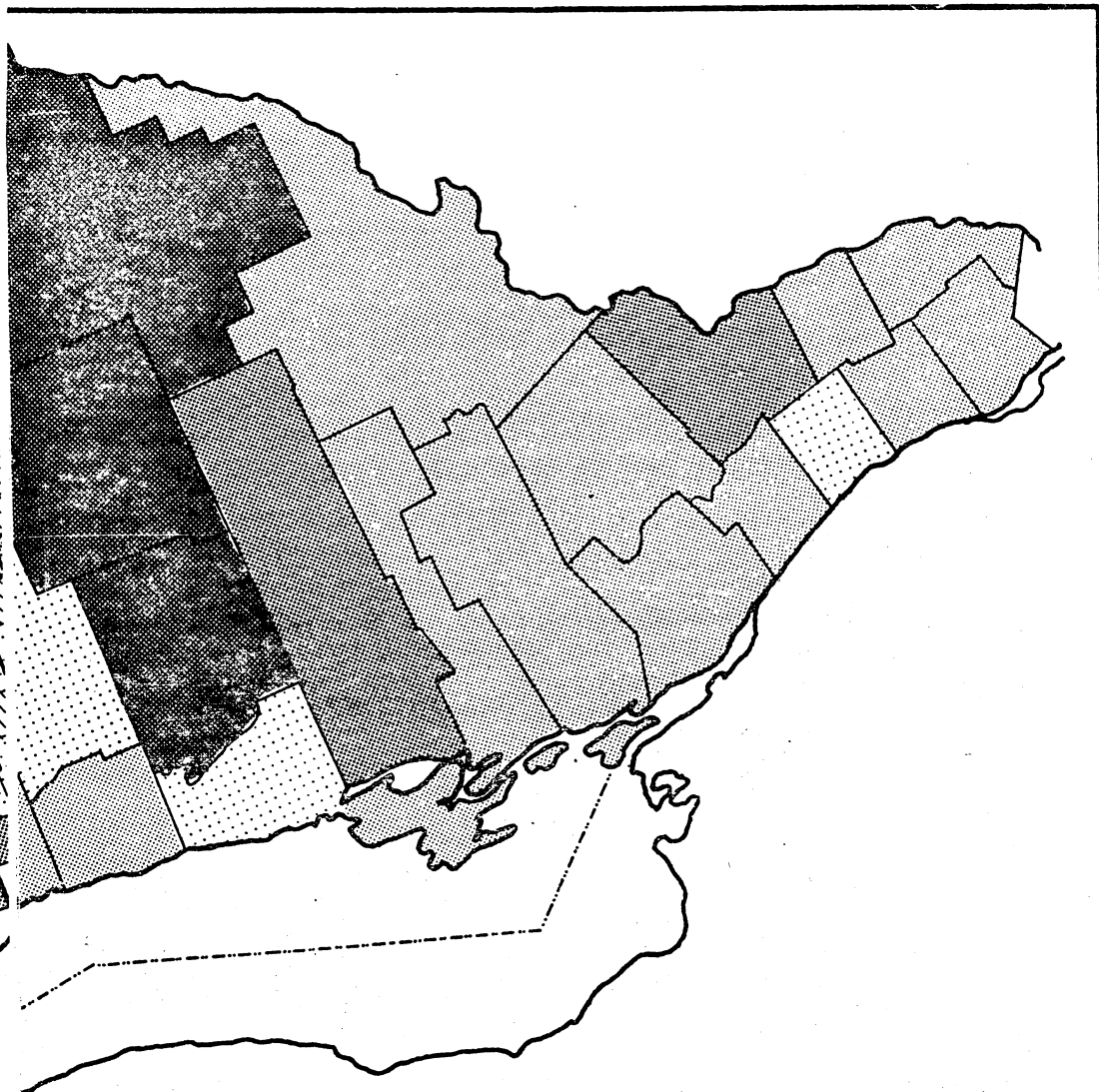
Migrants per
1,000 acres

0–15	
15–30	
30–45	
45–60	

dc

NET FARM OUT–MIGRANTS PER 1,000 ADJUSTED

ACRES FARM LAND BY COUNTY 1951–1961

MAP

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people. The truth is that increasingly vast numbers of urban people are choosing to live over broad areas outside of the traditional legal boundaries and settlement patterns.[10]

In this report, urban places have been treated in two ways. The first approach employs traditional city-town-village units but combines 10 of the urban places with their adjacent townships so that they can be mapped and tabulated as entire "metropolitan" units (Map 3 and Tables 3, 4, 5, and A3).[11] On the other hand, not every analytical purpose is served most meaningfully by examining urban government units only. Thus, the second approach in portraying urban migration is an areal arrangement of township units in which incorporated urban places are combined with the rural nonfarm population (Map 4 and Tables 2, A2, and A4). This is a rather rough but apparently effective way of showing the extent of urban dispersal in the open countryside, and of indicating the relative attractive power of generalized urban areas throughout the province.

In Table 2 the townships are summed to regional aggregations. The farm population released almost one quarter of a million people from agriculture during the decade. The percentage distribution of these migrants among counties is relatively even, with only Essex and Kent each having over 5% of the Southern Ontario total (Table A1). They and Simcoe and Carleton were the only four counties with over 10,000 farm out-migrants. The townships that had out-migration on balance

Table 2 NUMBER OF MIGRANTS, FARM AND URBAN PLUS RURAL NONFARM, BY REGION, 1951–61

Region[a]	Farm out-migration[b]	Urban plus rural nonfarm[c]				Total
		Out-migration	In-migration	Net	Rate[d]	
	(1)	(2)	(3)	(4)	(5)	(6)
Lake St. Clair	33,899	32,174	66,103	+ 33,929	+11.5	+ 30
Lake Erie	25,334	1,162	59,619	+ 58,457	+24.5	+ 33,123
Niagara	31,408	5,857	137,903	+132,046	+26.2	+100,638
Midwestern	19,578	1,867	47,566	+ 45,699	+20.7	+ 26,121
Georgian Bay	28,079	6,000	36,557	+ 30,557	+16.4	+ 2,478
Metropolitan	18,601	253	412,439	+412,186	+32.4	+393,585
Lake Ontario	34,862	2,788	52,374	+ 49,586	+25.7	+ 14,724
Eastern	48,699	4,396	133,418	+129,022	+27.1	+ 80,323
St. Lawrence	19,027	1,472	32,620	+ 31,148	+20.6	+ 12,121
Ottawa	29,672	2,924	100,798	+ 97,874	+30.1	+ 68,202
Northeastern (part)	6,546	3,520	13,184	+ 9,664	+19.8	+ 3,118
Southern Ontario	247,006	58,017	959,163	+901,559	+26.3	+654,140

[a]See Table A2 for these data by counties.

[b]For the rate of farm out-migration see Tables 1 and A1.

[c]These data are summations of small-area estimates. In a region, all municipalities which had net urban plus rural nonfarm out-migration are represented in column 2, and those municipalities with net urban plus rural nonfarm in-migration are summed in column 3.

[d]Net migration as a percentage of total urban plus rural nonfarm population in 1951.

from their combined urban plus rural nonfarm[12] populations lost relatively few in total—under 60,000, of which the Windsor area accounted for over half. However, we see in Table A2 that most counties had some townships with urban+nonfarm out-migration, and only seven counties had urban+nonfarm in-migration in every township unit (Table A2, column 2). On the other hand, only Muskoka, Manitoulin, and Prescott had overall net urban+nonfarm out-migration (Table A2, column 4). When only urban places are tabulated, 12 counties had urban out-migration in total.[13] The rural nonfarm "vote" is significant. These comparisons are presented to show that many incorporated places cannot attract population and that the open countryside is attracting population.

The regional distribution of the urban+nonfarm in-migrants is very uneven. Out of the total of almost one million who migrated into these urban+nonfarm units, almost 300,000 went into the metropolitan Toronto area, over 400,000 into the whole Metropolitan Region, plus almost 140,000 into the adjacent Niagara Region. These two regions account for almost 60% of the total (see Table A4).

These population movements represent enormous human adjustments: one-quarter million people adjusting to a way of life off the farm, many going into cities, and perhaps another half-million moving from a foreign land. The gross domestic internal movements would be far larger.

The net urban+nonfarm in-migration rates on a county basis include 27 counties with rates over 20% (of 1951 population), and 12 had rates over 30% (Table A2).

The pattern (or its lack) of in-migration to urban places is presented in Map 3, ignoring the rural nonfarm areas for the moment, except for the 10 places treated as metropolitan units. The dominant feature is the clustering of places with rates over 20% in the triangle formed by Kitchener-Barrie-Oshawa. The places in that triangle are almost all over 20%, and that triangle includes a high proportion of the places that had high in-migration.

Urban places which suffered out-migration tended to be on the peripheries of the most developed portions of Southern Ontario—starting from west of London and extending in a broad band along Lake Huron and up into Muskoka and Parry Sound, along the southern edge of the Precambrian Shield, and into Eastern Ontario.

The area southwest of the Toronto-Barrie line has an apparently uniform distribution of urban places. Its relatively dense pattern of places represents one of the most highly developed regions of the continent. Within that region there appear to be two different patterns. South of the Sarnia-Kitchener-Barrie arc there are relatively few places with 1951 population under 1,000, and there are relatively few places with out-migration. There are also few instances of fast in-migration. On the other hand, the northern part is much less urbanized, with many places having a population under 1,000 and a high proportion of out-migration. (See the size distributions in Table 5.)

The urban data of Map 3 are tabulated by size, region, and migration rate in Tables 3–5. When the data were plotted on a scatter diagram there appeared to be no relation between size of base population and the rate of net migration. However, with the data grouped in Table 3 there were evidently some strong tendencies present. It is hard to avoid concluding that the probability of a place having in-

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Table 3 DISTRIBUTION OF URBAN PLACES BY POPULATION SIZE (1951) AND MIGRATION RATE (1951–61), SOUTHERN ONTARIO

1951 population size ('000)	Places with migration rates			Total places	Average migration rate[a]
	Under 0	0 to 20%	Over 20%		
A. Numerical distribution of places by population size and migration rate[b]					
Under 1.0	67	24	12	103	+ 1.9
1.0– 4.9	36	60	18	114	+10.4
5.0– 9.9	6	11	7	24	+13.9
10.0–99.9	4	15	8	27	+24.4
100.0 and over	1	2	2	5	+13.9
Total	114	112	47	273	+ 8.9
B. Percentage distribution of places by migration rate and population size					
Under 1.0	65.0	23.3	11.7	100.0	
1.0– 4.9	31.3	53.0	15.7	100.0	
5.0– 9.9	25.0	45.8	29.2	100.0	
10.9–99.9	14.8	55.6	29.6	100.0	
100.0 and over	20.0	40.0	40.0	100.0	
Total	41.6	41.2	17.2	100.0	
C. Percentage distribution of places by population size and migration rate					
Under 1.0	58.7	21.2	25.5	37.6	
1.0– 4.9	31.6	54.0	38.3	41.9	
5.0– 9.9	5.3	9.7	14.9	8.8	
10.0–99.9	3.5	13.3	17.0	9.9	
100.0 and over	0.9	1.8	4.3	1.8	
Total	100.0	100.0	100.0	100.0	

[a]Simple average.   [b]For similar tabulation by region see Table A3.

Table 4 AVERAGE MIGRATION RATE IN URBAN PLACES, BY SIZE AND REGION, 1951–61
(Simple average)

Region	1951 population size ('000)					Total
	Under 1.0	1.0–4.9	5.0–9.9	10.0–99.9	100.0+	
Lake St. Clair	+ 4.6	+ 8.8	− 3.1	+ 8.9	− 2.6	+ 6.1
Lake Erie	+ 5.1	+11.3	+ 6.7	+ 14.3	+20.6	+ 8.4
Niagara	+ 6.8	+23.8	+ 3.9	+ 10.7	+10.1	+14.3
Midwestern	+ 1.2	+ 4.6	+34.2	+ 24.2		+ 7.9
Georgian Bay	− 3.9	+ 6.7	+ 0.3	+ 13.3		+ 0.4
Metropolitan	+75.6	+81.7	+75.2	+163.7	+26.1	+86.4
Lake Ontario	+ 5.4	+ 3.2	+14.0	+ 2.6		+ 5.1
Eastern	− 3.5	+ 2.9	− 3.3	+ 13.2	+15.2	+ 1.9
St. Lawrence	−12.2	+ 5.2		+ 11.5		− 0.3
Ottawa	+ 7.0	+ 0.8	− 3.3	+ 15.7	+15.2	+ 3.6
Northeastern (part)	−20.4	−13.9		+ 6.7		−13.7
Southern Ontario	+ 1.9	+10.4	+13.9	+ 24.4	+13.9	+ 8.9

Table 5 NUMBER OF URBAN PLACES BY POPULATION SIZE AND REGION

|	*1951 population size ('000)*					
Region	Under 1.0	1.0–4.9	5.0–9.9	10.0–99.9	100.0+	*Total*
Lake St. Clair	13	15	2	2	1	33
Lake Erie	15	9	3	2	1	30
Niagara	2	8	4	4	1	19
Midwestern	7	19	1	5		32
Georgian Bay	36	19	3	3		61
Metropolitan	2	6	3	2	1	14
Lake Ontario	12	16	4	3		35
Eastern	13	19	4	5	1	42
St. Lawrence	7	9		3		19
Ottawa	6	10	4	2	1	23
Northeastern (part)	3	3		1		7
Southern Ontario	103	114	24	27	5	273

migration of over 20% rose with size of place, and that the probability of having out-migration fell with size of place. The simple average rate by size group cannot be interpreted as showing rising migration rate with size because the variances are large. In Table 4 there are average rates by size for each region and there is no clear relation of rates to size, even though four of the nine regions have their highest average rate in the 10,000–100,000 size groups. Every size group except those under 1,000 has at least one region for which that size group has the region's highest average rate.

Over 40% of all urban places had out-migration (Table 3, panel B). Of the places with out-migration, over 90% were under 5,000 in size in 1951 (Table 3, panel C) while that size range is 80% of all places. Forty-two percent of all urban places had populations of 1,000 to 5,000, but they account for 54% of all places with moderate in-migration. Places over 10,000 are less than 12% of the total number, but account for over 21% of the places with fast in-migration.

The number of major urban centers in Southern Ontario is small, but there is a host of smaller places. The smallest places, which have never managed to grow beyond 1,000, are rarely near the largest cities. Also, there are few instances of out-migration near these large cities. Some relation may exist between migration rates and proximity to major cities. In 1951 five cities had populations over 100,000: Windsor, London, Hamilton, Toronto, and Ottawa. All other towns and cities with 1951 population over 1,000 were grouped by distance to the nearest of the five major urban places, and the simple average migration rates were calculated:

Table 6 MIGRATION RATE AND PROXIMITY TO MAJOR URBAN CENTER, SOUTHERN ONTARIO, 1951–61

	Distance (miles)					
	<15	15–24	25–34	35–54	55–75	>75
Average migration rate (%)	39.5	23.5	12.7	7.4	5.7	−1.3
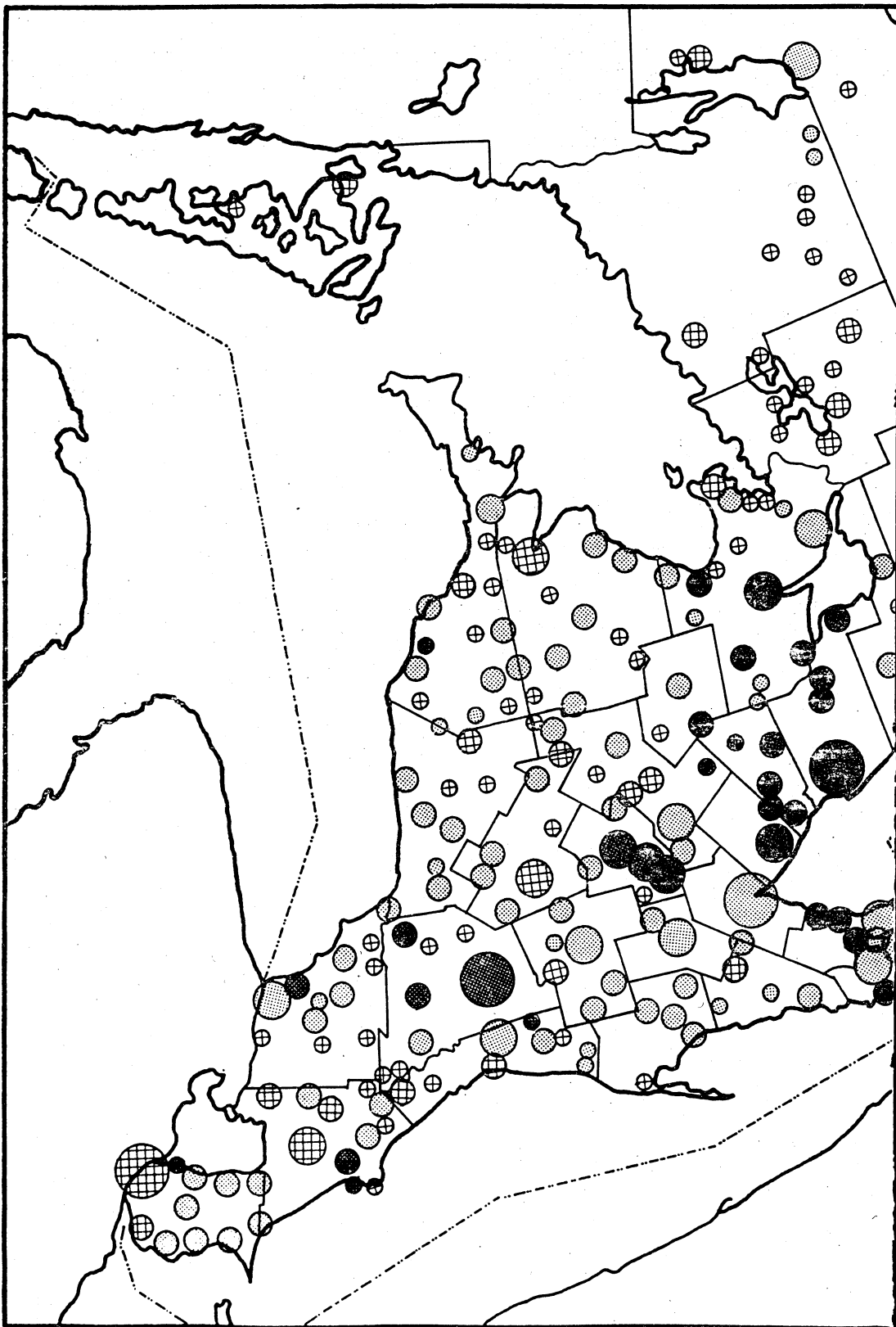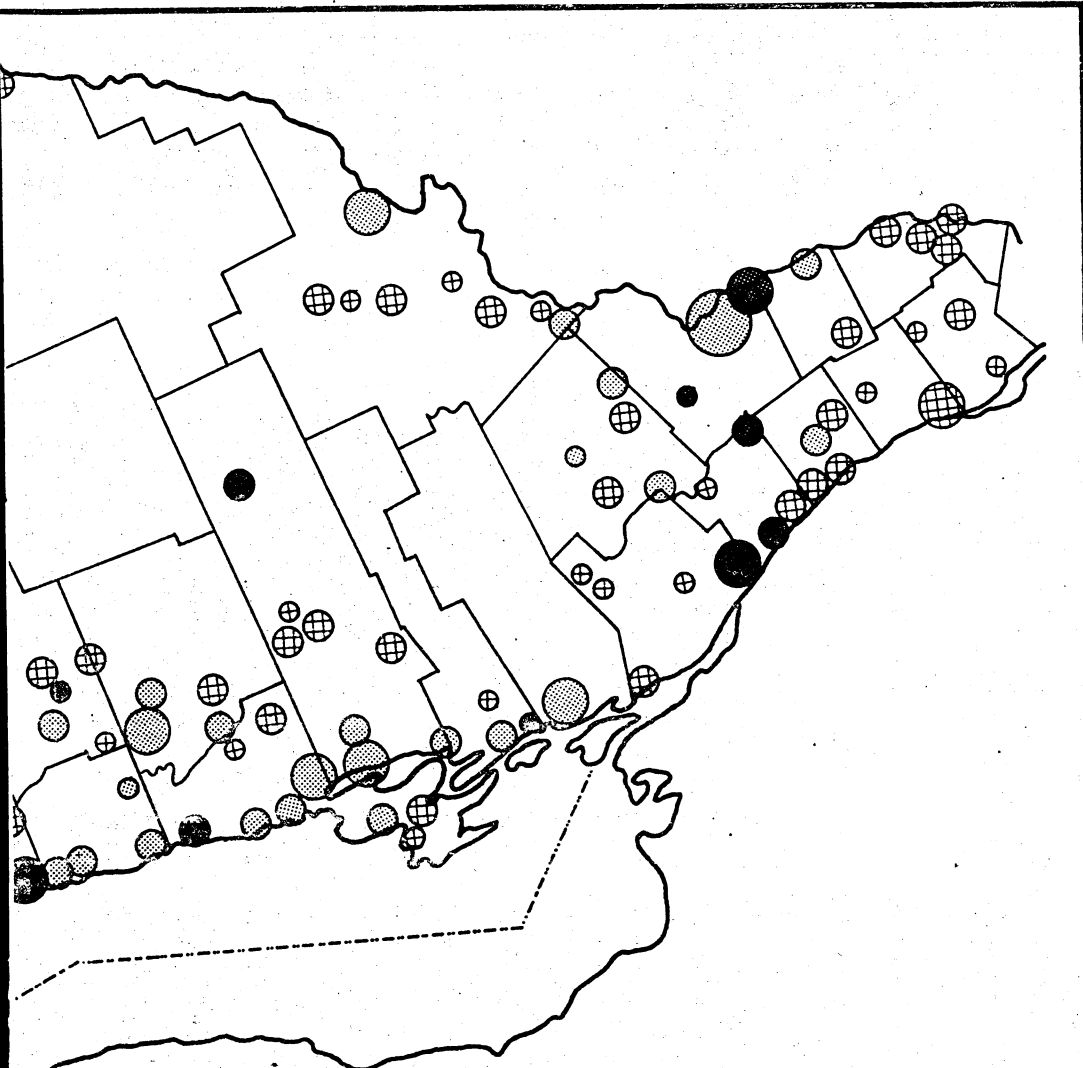
Size of Place | Out-migration | In-migration

	Out-migration	In-migration 0-20 per cent	In-migration 20 plus per cent
100,000 plus	⊞	○	●
10,000–100,000	⊞	○	●
1,000–10,000	⊕	○	●
under 1,000	⊕	○	●

dc

NET MIGRATION OF URBAN PLACES 1951–1961

MAP
3

	Net Urban Plus		
Total	Rural Non–Farm		Farm
in–migration :	in	>	out
out–migration :	in	<	out
out–migration :	out		out

dc

TOTAL NET MIGRATION OF URBAN AND RURAL

POPULATIONS BY TOWNSHIP UNIT 1951–1961

MAP

4

There is a most striking inverse relation, apparently. No doubt there is a considerable variation within each group, and the relation should be tested for significance. The very high rates of in-migration in the vicinity of Toronto contribute to the average of nearly 40% for places closest to a major center. However, the averages show a consistent decline the more remote a place is from the economic centers. This relation is consistent with some theorizing about urban economics and the nature of the relation between urban size, an economy's urban structure, and the growth dynamics of individual cities. There would seem to be some form of growth effect for small cities which is created by the size of larger cities, and which is diminished by distance. This is not necessarily over-spill in the literal sense of population flowing out of an over-full container (Windsor had out-migration and Hamilton and Ottawa had fairly modest migration rates). It may be more in the nature of a stimulation effect, like radiant heat energy, to use a physical analogy. Such stimulation by proximity to a major neighbor might operate through inter-industry linkages coupled with the fact that certain forms of economic activity tend to locate selectively with respect to urban size (being positively or negatively related to size). For example, growth in the large city may increase demand for an industry which is not located in that large city but is located in nearby small towns in order to secure the environment it needs and to avoid paying for big-city features it does not need.

All the final estimates generated in this study are combined in Map 4 to display the overall migration surface of Southern Ontario. Much numerical detail is suppressed in order to portray the major relationships. Heavy shading is used to indicate all township units in which there was overall in-migration on balance among the farm, urban, and rural nonfarm components. Two forms of out-migration are indicated: (a) in-migration in the urban plus rural nonfarm segment offset by a larger number of farm out-migrants, and (b) urban plus rural nonfarm out-migration as well as farm out-migration.[14]

No distinction has been made in the map among the several other combinations of the urban and rural nonfarm components separately, although some inferences can be made by comparing Maps 3 and 4. The urban and rural nonfarm migration flows are opposite in sign in a number of township units, and some of these are discussed below.

The approach used in Map 4 has the merit of solving the problem of city annexations from townships, by the complete merging of the urban and the surrounding rural nonfarm components. The estimate of rural nonfarm migration is weaker than the urban estimate, but at least it is based on the rate of natural increase for the particular local area rather than on some provincial or Canadian average.

A significant feature of the migration surface in Map 4 is the complex intermingling of the three classes of migration experience. Twenty of the 47 counties and districts contain all three of the mapped classes, and only 5 counties were uniformly composed of only one shading.[15] The remaining 22 counties had at least two classes of migration within their borders.

There are many villages under 1,000 and small towns which had out-migration but whose surrounding townships had rural nonfarm in-migration, even though the latter in-flow was too small to offset the farm out-migration.[16] This is especially

true in the area outside the triangle formed by London-Barrie-Belleville, that is, in Lambton, Kent, Elgin, Bruce, Grey, Parry Sound, Muskoka, a band east of Lake Simcoe set back from Lake Ontario about 30 miles, Renfrew, and the easternmost five counties.

Relatively few of the larger urban places had out-migration when the surrounding township by itself had overall in-migration. Some examples worth noting are Windsor, Stratford, Niagara Falls, Elora, Fergus, Parry Sound, and Gananoque. At least in the case of Niagara Falls the explanation is a lag in extending the city boundaries; in the case of Windsor, the city was going through a period of severe industrial adjustment.

There also appear to be relatively few examples which reverse the above relation, that is, where the town had in-migration when the township had overall out-migration: Elmira, Blenheim, Ridgetown, Wiarton, Stayner, and Listowel. These are much smaller places than the cities mentioned in the preceding paragraph.

SUMMARY AND CONCLUSIONS

The dominant feature of the overall net migration surface for Southern Ontario, presented on Map 4 by small-area units, is the vast area of in-migration. There is an almost solid continuous zone of growth from the Niagara River sweeping around the end of Lake Ontario past Hamilton to Kitchener-Waterloo and northeast to the shore of Georgian Bay. East of Toronto there was a much more limited zone, a single tier of municipalities along the Lake Ontario north shore past Kingston to Prescott and then north along Highway 16 to Ottawa. Outside of this central zone, there is a considerable amount of in-migration near London, but throughout the southwestern regions there are large areas of out-migration despite the substantial numbers of cities and towns. In the Precambrian Shield region there are only a few small isolated areas of in-migration,[17] related to the emerging outdoor recreation boom and to a few "frontier" settlements based on new mining ventures or military and scientific establishments.

The area between London and the Niagara Peninsula appears to present a confused or uncertain state of development during the 1950's. The urban places are generally small but had in-migration with few exceptions. There is a diffuse pattern of townships with in-migration. The area might appear to be stagnant—certainly not declining, but certainly not showing strong growth despite its generally very prosperous agriculture, its location on the Buffalo-Detroit corridor, and its lake access. One is tempted to advance the thought that there was an urbanization vacuum in this area during the 1950's, perhaps caused by a diffuse highway system. Strategic highway construction might release a tremendous growth potential. Recent announcements of new hydro generating capacity and two steel plants in the middle of this area may be the key to enormous growth in the 1970's, now that a strong growth focus has been provided.

In the opening paragraphs of this paper it was asserted that educational planning must recognize the demographic tides that press over our countryside. Most migrants have or promptly start to have several children. The task of the educational planner becomes impossible if the future location of children is unknown.

The objective of meeting the needs of the region with suitable facilities and programs can be realized only if the changing character of the region is recognized.

The dominant phenomenon portrayed in Map 4 has been unnoticed by virtually all planners, including educational planners, to the sorrow of taxpayers now and in the future. That phenomenon is the in-migration of urban people across our rural countryside in a dispersed pattern. In the past, most in-migration streams could be represented by points on a map—the cities. Reality can no longer be portrayed in that fashion. Urban people are now spreading out over the countryside, far beyond the suburbs, in a subliminal process that has largely evaded direct recognition. The evidence in this report documents the great spatial extent of this modern plague, which was observable as long ago as the 1950's. It is now probably one of the most troublesome phenomena in current urban and regional planning, carrying enormous and threatening implications for public costs, future development costs and patterns, agricultural adjustment, parks and recreation, scenic amenities throughout the countryside, tourist earnings, and even our foreign exchange position. With respect to education in particular, there can be no doubt that this phenomenon adds to the costs (in money, time, and energy) of the child's travel to school, and detracts from the quality of his life. There are detrimental effects on school size and equipment and on curriculum choices. Perhaps the most ominous aspect is that it is continuously eroding our current and future options for achieving the urban places and rural countryside that human beings want and need for their economic, social, and mental health. The danger is in the bountiful ignorance not only of the nature of this phenomenon, but even of its existence.

Appendix

Table A1 FARM LAND AND POPULATION (1951) AND MIGRATION (1951–56), BY REGION AND COUNTY

Region and county	Share of total Southern Ontario			1951 Farm population per 1,000 adjusted acres	Farm migrants per 1,000 adjusted acres	Farm migration rate[b] (%)
	Adjusted farm acres 1951[a] (%)	Farm population 1951 (%)	Farm migrants 1951–1961 (%)			
Lake St. Clair	10.70	11.9	13.7	57.1	−25.7	−45.0
Essex	2.79	4.4	5.4	81.4	−38.6	−47.5
Kent	3.96	4.1	5.6	53.1	−28.2	−53.0
Lambton	3.95	3.4	2.8	43.9	−14.0	−32.0
Lake Erie	12.16	12.7	10.3	53.5	−16.9	−31.5
Middlesex	4.38	4.1	3.3	48.3	−15.0	−31.0
Elgin	2.62	2.6	2.2	51.7	−16.9	−32.7
Oxford	3.07	3.0	2.2	50.8	−14.3	−28.2
Norfolk	2.10	2.9	2.6	70.8	−24.6	−34.7
Niagara	7.02	11.2	12.7	82.0	−36.2	−44.2
Brant	1.44	2.0	2.4	70.2	−34.6	−48.4
Wentworth	1.48	3.0	4.0	104.3	−53.7	−51.5
Lincoln	1.24	2.8	3.0	116.5	−48.1	−41.3
Haldimand	1.87	1.7	1.2	46.1	−13.0	−28.3
Welland	1.00	1.8	1.1	90.2	−42.2	−46.8

Region and county	Share of total Southern Ontario			1951 Farm population per 1,000 adjusted acres	Farm migrants per 1,000 adjusted acres	Farm migration rate[b] (%)
	Adjusted farm acres 1951[a] (%)	Farm population 1951 (%)	Farm migrants 1951–1961 (%)			
Midwestern	14.59	11.7	7.9	40.9	−10.9	−26.6
Huron	5.07	3.4	2.2	33.9	− 8.9	−26.1
Perth	3.69	3.0	1.8	41.3	− 9.9	−24.1
Wellington	3.89	3.0	1.5	39.2	− 7.9	−20.1
Waterloo	1.94	2.4	2.3	62.2	−23.9	−38.5
Georgian Bay	16.40	13.7	11.4	42.8	−13.9	−32.4
Bruce	4.44	3.0	1.9	34.7	− 8.5	−24.5
Grey	4.77	3.8	2.3	41.2	− 9.8	−23.8
Dufferin	1.97	1.3	0.9	33.8	− 8.7	−25.6
Simcoe	4.17	4.0	4.3	49.1	−20.4	−41.5
Muskoka	0.30	0.5	0.5	80.7	−32.5	−40.3
Parry Sound	0.76	1.1	1.6	73.8	−41.6	−56.3
Metropolitan	7.04	6.1	7.5	44.6	−21.4	−48.0
Halton	1.26	0.8	1.8	33.6	−28.6	−84.9
Peel	1.17	1.1	1.4	46.3	−23.0	−49.8
York	2.54	2.3	2.5	46.2	−19.3	−41.9
Ontario	2.07	2.0	1.9	48.4	−18.7	−38.6
Lake Ontario	12.44	12.4	14.1	51.1	−22.7	−44.5
Durham	1.72	1.8	1.5	54.3	−17.5	−32.1
Victoria	2.07	1.5	0.8	36.5	− 7.6	−20.8
Northumberland	1.97	1.2	1.2	30.2	−12.2	−40.3
Peterborough	1.50	2.3	3.8	77.7	−50.5	−65.0
Haliburton	0.17	0.3	0.5	93.0	−60.8	−65.3
Prince Edward	1.23	1.2	1.3	49.9	−20.1	−41.7
Hastings	2.32	2.7	3.9	60.2	−33.6	−55.9
Lennox & Addington	1.47	1.4	1.2	50.3	−15.9	−31.6
Eastern Ontario	18.17	18.3	19.7	51.4	−21.7	−42.2
St. Lawrence Subregion	8.27	8.3	7.7	51.7	−18.7	−36.1
Frontenac	1.52	1.7	2.1	56.1	−27.3	−48.7
Leeds	1.64	1.5	1.2	48.3	−15.0	−31.1
Grenville	1.07	1.0	1.0	49.5	−19.3	−39.1
Dundas	1.46	1.3	0.9	46.0	−12.1	−26.3
Stormont	1.22	1.3	1.2	55.3	−19.9	−36.0
Glengarry	1.36	1.5	1.3	55.8	−18.8	−33.6
Ottawa Subregion	9.90	10.0	12.0	51.2	−24.3	−47.4
Renfrew	2.60	2.8	3.6	52.8	−27.6	−52.3
Lanark	1.56	1.6	1.5	53.9	−18.9	−35.1
Carleton	2.58	2.5	4.2	49.0	−32.6	−66.7
Russell	1.37	1.5	1.3	55.0	−18.9	−34.4
Prescott	1.79	1.6	1.5	46.8	−16.3	−34.7
Northeastern (part)	1.48	2.0	2.7	70.9	−35.9	−50.6
Nipissing	0.80	1.3	1.9	84.7	−45.8	−54.0
Manitoulin	0.67	0.7	0.8	54.5	−24.2	−44.3
Southern Ontario	100.00	100.0	100.0	51.3	−20.0	−39.1

[a]The adjusted farm acres are equal to improved land acreage plus one-tenth of the unimproved pasture acreage in all census farm units.

[b]See Tables 2 and A2 for the number of farm out-migrants.

Table A2   NUMBER OF MIGRANTS, FARM AND URBAN PLUS RURAL NON-FARM, BY REGION AND COUNTY, 1951–61

Region and county	Farm out-migration[a] (1)	Urban plus rural nonfarm[b]				Total
		Out-migration (2)	In-migration (3)	Net	Rate[c]	
Lake St. Clair	33,899	32,174	66,103	+ 33,929	+ 11.5	+ 30
Essex	13,319	30,288	39,930	+ 9,642	+ 5.1	− 3,677
Kent	13,745	172	9,533	+ 9,361	+ 17.6	− 4,384
Lambton	6,835	1,714	16,640	+ 14,926	+ 27.9	+ 8,091
Lake Erie	25,334	1,162	59,619	+ 58,457	+ 24.5	+ 33,123
Middlesex	8,096	201	36,926	+ 36,725	+ 27.0	+ 28,629
Elgin	5,447	181	7,195	+ 7,014	+ 18.1	+ 1,567
Oxford	5,423	662	8,243	+ 7,581	+ 19.1	+ 2,158
Norfolk	6,368	118	7,255	+ 7,137	+ 29.3	+ 769
Niagara	31,408	5,857	137,903	+132,046	+ 26.2	+100,638
Brant	6,028	27	5,269	+ 5,242	+ 8.7	− 786
Wentworth	9,820		78,058	+ 78,058	+ 31.6	+ 68,238
Lincoln	7,345		25,475	+ 25,475	+ 35.6	+ 18,130
Haldimand	3,011		3,252	+ 3,252	+ 24.1	+ 241
Welland	5,204	5,830	25,849	+ 20,019	+ 17.9	+ 14,815
Midwestern	19,578	1,867	47,566	+ 45,699	+ 20.7	+ 26,121
Huron	5,540	749	4,445	+ 3,696	+ 13.2	− 1,844
Perth	4,529	122	2,745	+ 2,623	+ 7.8	− 1,906
Wellington	3,776	800	11,089	+ 10,289	+ 21.4	+ 6,513
Waterloo	5,733	196	29,287	+ 29,091	+ 26.2	+ 23,358
Georgian Bay	28,079	6,000	36,557	+ 30,557	+ 16.4	+ 2,478
Bruce	4,662	555	2,406	+ 1,851	+ 8.3	− 2,811
Grey	5,761	646	2,919	+ 2,273	+ 6.6	− 3,488
Dufferin	2,100	80	2,223	+ 2,143	+ 33.7	+ 43
Simcoe	10,488	1,215	24,479	+ 23,264	+ 28.7	+ 12,776
Muskoka	1,185	1,867	1,597	− 270	− 1.2	− 1,455
Parry Sound	3,883	1,637	2,933	+ 1,296	+ 6.3	− 2,587
Metropolitan[d]	18,601	253	412,439	+412,186	+ 32.4	+393,585
Halton	4,457		34,316	+ 34,316	+139.8	+ 29,859
Peel	3,321		13,483	+ 13,483	+103.0	+ 10,162
York	6,055	44	45,342	+ 45,298	+103.0	+ 39,243
Metro Toronto	—		294,887	+294,887	+ 26.1	+294,887
Ontario	4,768	209	24,411	+ 24,202	+ 40.2	+ 19,434
Lake Ontario	34,862	2,788	52,374	+ 49,586	+ 25.7	+ 14,724
Durham	3,706		11,394	+ 11,394	+ 61.3	+ 7,688
Victoria	1,932	878	2,364	+ 1,486	+ 8.3	− 446
Northumberland	2,966	40	2,028	+ 1,988	+ 7.6	− 978
Peterborough	9,336	202	13,307	+ 13,105	+ 28.2	+ 3,769
Haliburton	1,270	449	1,726	+ 1,277	+ 22.3	+ 7
Prince Edward	3,168	513	3,025	+ 2,512	+ 22.9	− 656
Hastings	9,609	591	14,256	+ 13,665	+ 23.9	+ 4,056
Lennox & Addington	2,875	115	4,274	+ 4,159	+ 39.9	+ 1,284
Eastern Ontario	48,699	4,396	133,418	+129,022	+ 27.1	+ 80,323
St. Lawrence Subregion	19,027	1,472	32,620	+ 31,148	+ 20.6	+ 12,121
Frontenac	5,115	126	12,669	+ 12,543	+ 22.6	+ 7,428
Leeds	3,040	362	6,128	+ 5,766	+ 19.8	+ 2,726

Table A2 (Continued)

Region and county	Farm out-migration[a]	Urban plus rural nonfarm[b]				Total
		Out-migration	In-migration	Net	Rate[c]	
	(1)	(2)	(3)			
Eastern Ontario						
St. Lawrence						
Subregion (cont.)						
Grenville	2,545	255	6,290	+ 6,035	+ 57.3	+ 3,490
Dundas	2,179	440	1,810	+ 1,370	+ 18.2	− 809
Stormont	3,000	109	1,515	+ 1,406	+ 3.5	− 1,594
Glengarry	3,148	180	4,208	+ 4,028	+ 48.3	+ 880
Ottawa Subregion	29,672	2,924	100,798	+ 97,874	+ 30.1	+ 68,202
Renfrew	8,844	1,401	23,027	+ 21,626	+ 43.4	+ 12,782
Lanark	3,641	265	4,646	+ 4,381	+ 17.4	+ 740
Carleton	10,396		69,753	+ 69,753	+ 30.8	+ 59,357
Russell	3,192	93	2,337	+ 2,244	+ 26.8	− 949
Prescott	3,599	1,165	1,035	− 130	− 0.9	− 3,729
Northeastern (part)	6,546	3,520	13,184	+ 9,664	+ 19.8	+ 3,118
Nipissing	4,535	2,775	12,452	+ 9,677	+ 23.0	+ 5,142
Manitoulin	2,011	745	732	− 13	− 0.2	− 2,024
Southern Ontario	247,006	58,017	959,163	+901,146	+ 26.3	+654,140

[a]For the rate of farm out-migration see Table 1 and Table A1.

[b]These data are summations of small-area estimates. In a region, all municipalities which had net urban plus rural nonfarm out-migration are represented in column 2, and those municipalities with net urban plus nonfarm in-migration are summed in column 3.

[c]Net migration as a percentage of total urban plus rural nonfarm population in 1951.

[d]Metro Toronto includes Toronto and Toronto Gore Townships in Peel County and Pickering Township in Ontario County.

Table A3   DISTRIBUTION OF URBAN PLACES BY POPULATION SIZE (1951) AND MIGRATION RATE (1951–61), BY REGION

Region	1951 population ('000)	Places with migration rates			Total Places	Average migration rate[a] (%)
		Under 0	0–20%	Over 20%		
Lake St. Clair	Under 1.0	9	1	3	13	+ 4.6
	1.0– 4.9	1	12	2	15	+ 8.8
	5.0– 9.9	1	0	1	2	− 3.1
	10.0–99.9	1	1	0	2	+ 8.9
	100.0 Over	1	0	0	1	− 2.6
	Total	13	14	6	33	+ 6.1
Lake Erie	Under 1.0	7	5	2	14	+ 5.1
	1.0– 4.9	1	8	0	9	+11.3
	5.0– 9.9	1	2	0	3	+ 6.7
	10.0–99.9	0	2	0	2	+14.3
	100.0 Over	0	0	1	1	+20.6
	Total	9	17	3	29	+ 8.4
Midwestern	Under 1.0	5	1	1	7	+ 1.2
	1.0– 4.9	4	15	0	19	+ 4.6
	5.0– 9.9	0	0	1	1	+34.2
	10.0–99.9	1	1	3	5	+24.2
	100.0 Over	0	0	0	0	—
	Total	10	17	5	32	+ 7.9
Niagara	Under 1.0	0	2	0	2	+ 6.8
	1.0– 4.9	1	3	4	8	+23.8
	5.0– 9.9	0	3	1	4	+ 3.9
	10.0–99.9	0	3	1	4	+10.7
	100.0 Over	0	1	0	1	+10.1
	Total	1	12	6	19	+14.3
Georgian Bay	Under 1.0	25	10	1	36	− 3.9
	1.0– 4.9	5	10	4	19	+ 6.7
	5.0– 9.9	1	2	0	3	+ 0.3
	10.0–99.9	1	1	1	3	+13.3
	100.0 Over	0	0	0	0	—
	Total	32	23	6	61	+ 0.4
Metropolitan	Under 1.0	1	0	2	3	+75.6
	1.0– 4.9	1	1	4	6	+81.7
	5.0– 9.9	0	0	3	3	+75.2
	10.0–99.9	0	0	2	2	+163.7
	100.0 Over	0	0	1	1	+26.1
	Total	2	1	12	15	+86.4
Lake Ontario	Under 1.0	5	4	2	12	+ 5.4
	1.0– 4.9	9	6	1	16	+ 3.2
	5.0– 9.9	0	3	1	4	+14.0
	10.0–99.9	0	3	0	3	+ 2.6
	100.0 Over	0	0	0	0	—
	Total	14	16	4	34	+ 5.1

Region	1951 population ('000)	Places with migration rates			Total Places	Average migration rate[a] (%)
		Under 0	0–20%	Over 20%		
Eastern Ontario						
St. Lawrence Subregion	Under 1.0	7	0	0	7	−12.2
	1.0– 4.9	5	2	2	9	+ 5.2
	5.0– 9.9	0	0	0	0	—
	10.0–99.9	1	2	0	3	+11.5
	100.0 Over	0	0	0	0	—
	Total	13	4	2	19	− 0.3
Eastern Ontario						
Ottawa Subregion	Under 1.0	4	1	1	6	+ 7.0
	1.0– 4.9	6	3	1	10	+ 0.8
	5.0– 9.9	3	1	0	4	− 3.3
	10.0–99.9	0	1	1	2	+15.7
	100.0 Over	0	1	0	1	+15.2
	Total	13	7	3	23	+ 3.6
Eastern Ontario total	Under 1.0	11	1	1	13	− 3.5
	1.0– 4.9	11	5	3	19	+ 2.9
	5.0– 9.9	3	1	0	4	− 3.3
	10.0–99.9	1	3	1	5	+13.2
	100.0 Over	0	1	0	1	+15.2
	Total	26	11	5	42	+ 1.9
Northeastern (part)	Under 1.0	3	0	0	3	−20.4
	1.0– 4.9	3	0	0	3	−13.9
	5.0– 9.9	0	0	0	0	—
	10.0–99.9	0	1	0	1	+ 6.7
	100.0 Over	0	0	0	0	—
	Total	6	1	0	7	−13.7
Southern Ontario	Under 1.0	67	24	12	103	+ 1.9
	1.0– 4.9	36	60	18	114	+10.4
	5.0– 9.9	6	11	7	24	+13.9
	10.0–99.9	4	15	8	27	+24.4
	100.0 Over	1	2	2	5	+13.9
	Total	114	112	47	273	+ 8.9

[a]Simple averages of migration rates.

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Table A4 FARM LAND AND POPULATION (1951) BY TYPE, AND DISTRIBUTION OF URBAN PLUS RURAL NONFARM MIGRANTS (1951–61), BY REGION AND COUNTY

| Region and county | Farm land[a] | | 1951 population | | Distribution of urban+rural nonfarm migrants (%) |
| | Improved land | Adjusted total | | | |
	(acres)		Farm	Urban+rural nonfarm	
Lake St. Clair	1,306,900	1,320,157	75,390	295,848	3.77
Essex	343,327	344,888	28,060	189,090	1.07
Kent	483,834	488,091	25,934	53,194	1.04
Lambton	479,739	487,178	21,396	53,564	1.66
Lake Erie	1,470,290	1,501,007	80,340	238,843	6.48
Middlesex	526,170	540,806	26,103	136,036	4.07
Elgin	316,526	322,708	16,672	38,846	.78
Oxford	373,087	378,238	19,209	39,609	.84
Norfolk	254,507	259,255	18,356	24,352	.79
Niagara	855,393	866,820	71,064	504,613	14.64
Brant	174,392	177,320	12,451	60,406	.58
Wentworth	179,806	182,928	19,077	247,006	8.65
Lincoln	151,440	152,547	17,768	71,598	2.83
Haldimand	228,445	230,827	10,650	13,488	.36
Welland	121,310	123,198	11,118	112,115	2.22
Midwestern	1,777,115	1,800,729	73,697	221,220	5.07
Huron	615,350	625,600	21,202	28,078	.41
Perth	452,528	455,630	18,810	33,774	.29
Wellington	472,083	479,909	18,792	48,138	1.14
Waterloo	237,154	239,590	14,893	111,230	3.23
Georgian Bay	1,955,892	2,024,099	86,569	186,834	3.42
Bruce	536,719	547,441	18,997	22,314	.21
Grey	564,203	589,038	24,249	34,711	.25
Dufferin	236,885	242,918	8,209	6,357	.24
Simcoe	498,164	514,790	25,272	81,210	2.58
Muskoka	33,663	36,503	2,944	21,769	b
Parry Sound	86,258	93,409	6,898	20,473	.14
Metropolitan	848,028	868,843	38,748	1,272,540	45.71
Halton	153,398	156,068	5,250	24,543	3.81
Peel	140,999	144,090	6,675	13,094	1.50
York	307,122	313,143	14,459	43,998	5.02
Metro Toronto	—		—	1,130,720	32.69
Ontario	246,509	255,542	12,364	60,185	2.69
Lake Ontario	1,449,713	1,535,780	78,417	193,185	5.51
Durham	204,770	212,304	11,536	18,579	1.26
Victoria	237,367	255,015	9,306	17,821	.17
Northumberland	232,640	243,395	7,356	26,126	.22
Peterborough	175,623	184,820	14,362	46,427	1.45
Haliburton	18,780	20,902	1,944	5,726	.14
Prince Edward	147,834	152,324	7,598	10,961	.29
Hastings	264,544	286,047	17,206	57,092	1.52
Lennox & Addington	168,155	180,973	9,109	10,435	.46
Eastern Ontario	2,133,252	2,242,201	115,313	476,447	14.33
St. Lawrence Subregion	963,684	1,020,300	52,767	151,186	3.46
Frontenac	166,534	187,251	10,498	55,601	1.39
Leeds	188,070	202,364	9,767	29,064	.64
Grenville	125,379	131,578	6,506	10,539	.67
Dundas	176,967	180,281	8,288	7,530	.15
Stormont	145,012	150,991	8,344	40,114	.16
Glengarry	161,722	167,835	9,364	8,338	.45

Table A4 (Continued)

Region and county	Farm land[a]		1951 population		Distribution of urban+rural nonfarm migrants (%)
	Improved land	Adjusted total	Farm	Urban+rural nonfarm	
	(acres)				
Eastern Ontario (cont.)					
Ottawa Subregion	1,169,568	1,221,901	62,546	325,261	10.87
Renfrew	300,702	320,717	16,927	49,790	2.40
Lanark	174,516	192,490	10,370	25,231	.49
Carleton	308,235	318,438	15,598	226,649	7.73
Russell	167,163	168,928	9,292	8,374	.25
Prescott	218,952	221,328	10,359	15,217	b
Northeastern (part)	165,126	182,281	12,927	48,804	1.07
Nipissing	91,985	99,068	8,392	42,125	1.07
Manitoulin	73,141	83,213	4,535	6,679	b
Southern Ontario	11,961,709	12,341,917	632,465	3,431,655	100.0

[a]Adjusted farm land is improved land plus one-tenth unimproved pasture acreage. The adjustment was made because of differences in productivity between improved land and unimproved pasture. See 1951 Census of Canada, Vol. VI, Part II, Table 29.

[b]This county had a small net urban plus rural nonfarm out-migration which was not included in the calculation of this column.
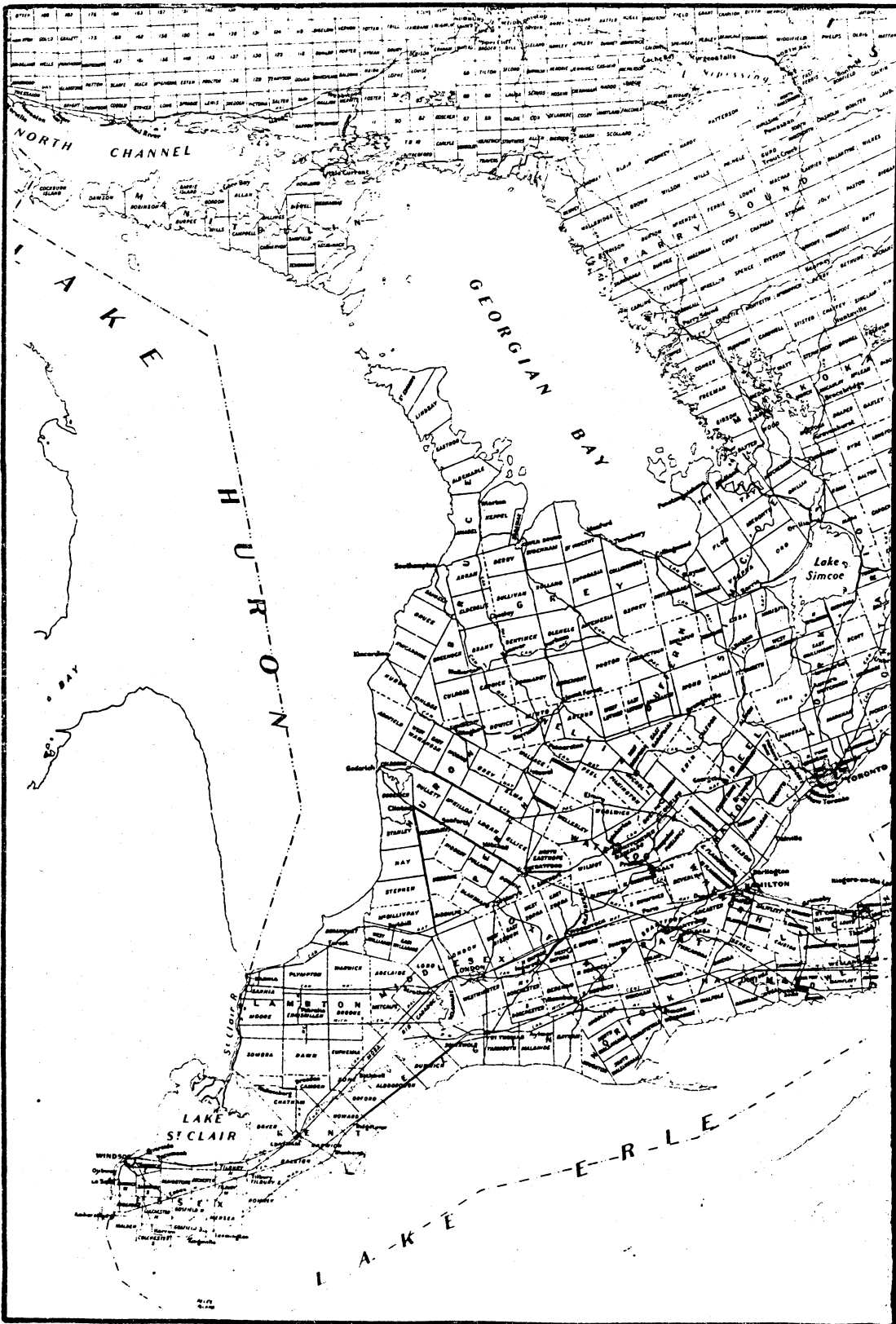
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Agricultural Economics		**5**

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Notes

1. This section is taken from a paper "Regional Variations in Net Migration in Southern Ontario, 1951–1961" presented in London, Ontario, to a seminar on urban economics arranged by the Canadian Council on Urban and Regional Research, January 1967.

2. An extensive investigation by Isabel B. Anderson has provided much new data at the level of the provinces: *Internal Migration in Canada 1921–1961,* Staff Study 13, Economic Council of Canada (Ottawa: Queen's Printer, 1966). There are a number of other recent and valuable contributions in this area, including Leroy Stone, *Urban Development in Canada: An Introduction to the Demographic Aspects,* DBS 1961 Census Monograph (Ottawa: Queen's Printer, 1967).

3. For a detailed discussion and case study of these topics see J. M. Henderson and Anne O. Krueger, *National Growth and Economic Change in the Upper Midwest* (Minneapolis: University of Minnesota Press, 1965), chap. 5. See also Werner Z. Hirsch, E. W. Segelhorst, and M. J. Marcus, *Spillover of Public Education Costs and Benefits* (Los Angeles: University of California, Institute of Government and Public Affairs, 1964) and other publications of the Institute of Government and Public Affairs.

4. H. S. Perloff, E. S. Dunn, E. E. Lampard, and R. F. Muth, *Regions, Resources and Economic Growth* (Baltimore: Johns Hopkins Press, 1960), pp. 56-57.

5. Ontario, Office of the Registrar General, *Province of Ontario Vital Statistics* (annual).

6. Walter Isard, *Methods of Regional Analysis: An Introduction to Regional Science,* Regional Science Studies, Series 4 (Cambridge, Mass.: MIT Press, 1960), pp. 54-56.

7. Anderson, *Internal Migration in Canada.*

8. Population on farms in 1961 was adjusted to allow for the change in census definition of farm between 1951 and 1961.

9. The adjusted acreage of land in census farm units is the sum of the number of acres of arable cropland and improved pasture plus one-tenth of the number of acres of rough and unimproved pasture. The latter acreage is reduced by that arbitrary fraction to make the two types of land more comparable in terms of labor-using potential, and because the proportion between the two types varies considerably by region. See Table A4.

10. See Urban Reports of Upper Midwest Economic Study, University of Minnesota, Minneapolis, especially *Urban Dispersal in the Upper Midwest,* by John R. Borchert, T. L. Anding, and M. Gildemeister (Minneapolis: University of Minnesota, 1964).

11. Greater Toronto area (left white on Map 4); London and townships of Westminster and London; Windsor and townships of Sandwich E. and Sandwich W.; Brantford and Brantford Township; Welland and Crowland Township; Niagara Falls and Stamford Township; St. Catharines and Grantham Township; Cornwall and Cornwall Township; Halton County plus Burlington; Hamilton and remainder of Wentworth County.

12. Expressed as "urban + nonfarm" in subsequent discussion.

13. Koop, "Urban and Rural Migration Flows," Appendix 4.

14. On Map 4, townships are treated as areal units rather than legal units; all population in each block is considered, whether or not it was in an incorporated town or city. When a town was near the boundary of a township, that township was combined with the adjacent township, as indicated by missing boundaries. In sparsely populated areas unseparated townships are in combination with others. Compare Map 3 with Map 1 and Map 5.

15. In Dundas County all four township units had out-migration, and there is uniform in-migration in York, Welland, Wentworth, and Peel counties.

16. This and the following two paragraphs are based on maps not presented in this report, but many of the comments can be confirmed from Maps 3 and 4.

17. The spatial extent of these areas is exaggerated on the map due to the existence of unorganized townships which are attached to more settled municipalities.