

Report of the Annual Meeting of the Canadian Historical Association Rapport de l'assemblée annuelle de la Société historique du Canada

Report of the Annual Meeting

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Volume 32, Number 1, 1953

URI: <https://id.erudit.org/iderudit/300344ar>

DOI: <https://doi.org/10.7202/300344ar>

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Publisher(s)

The Canadian Historical Association/La Société historique du Canada

ISSN

0317-0594 (print)

1712-9095 (digital)

[Explore this journal](#)

Cite this article

Packer, R. W. (1953). The Geographical Basis of the Regions of Southwestern Ontario. *Report of the Annual Meeting of the Canadian Historical Association / Rapport de l'assemblée annuelle de la Société historique du Canada*, 32(1), 45–52. <https://doi.org/10.7202/300344ar>

THE GEOGRAPHICAL BASIS OF THE REGIONS OF SOUTHWESTERN ONTARIO

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Southwestern Ontario will be considered as the wedge-shaped area bounded on the west and south by Lakes Huron and Erie and on the east by Lake Ontario and the Niagara escarpment, excluding the city of Hamilton. The region as a whole is isolated from the rest of Canada and the U. S. by topographic barriers, but these physical features are probably not as important to the people as the economic barriers which go with them. The international boundary through the lakes with its tariffs and trade preferences limits free flow in those directions. The strip of land along the crest of the escarpment, where moving ice scraped the rock bare of soil, cuts off Southwestern Ontario from the rest of the province. So the region has tended to become a unit in the thinking of its inhabitants. That is, the people think of themselves as belonging to this region; their viewpoint is inward, though there is some local regional specialisation.

The area is one of the most densely populated of Canada. Within this 15,779 square miles live 1,446,531 people or 10 per cent of the total population.¹ This is an average density of 92.9 per square mile compared with an average of only 4.04 per square mile for Canada as a whole and 12.65 for the province of Ontario.

The physical build of the area presents an interesting contrast between the very old and the very new. The underlying solid rock was laid down in the seas of the Paleozoic Era of geological history, when life forms were confined to vegetation and primitive sea animals. Traces of these remain for us in their fossils. The rocks which enclose them are chiefly limestones, dolomites and shales. After these rocks solidified they were uplifted above the sea and exposed to the erosive effects of wind and water for about 250,000,000 years. During this time the horizontal layers of rock became slightly tilted from east to west and the more resistant Lockport dolomite became the crest of an escarpment stretching from Queenston to the east coast of the Bruce peninsula.² Then, only about a million years ago, the climate became colder and a thick covering of ice spread over the whole region. This ice in some places scraped the rocks over which it passed, in some it gouged our great basins now filled by lakes, in others plastered ground-up rocks and boulders upon the solid layer beneath. Probably four times this ice melted and three times it came back again. Each time it added to the amount of debris so that a mantle of clays, gravels, sands and

¹Canada, Bureau of Statistics, Census Division, *Ninth Census of Canada*, 1951 (Ottawa, 1952), Bulletin 1-13, 13-17.

²J. F. Caley, *Paleozoic Geology of the Toronto-Hamilton area*, Ontario Geological Survey of Canada, Memoir 224, (Ottawa, 1940), 8-9.

tills covers nearly all the solid rock except along the crest of the escarpment.³ This glacial drift is up to 200 feet thick in Essex County and gradually becomes shallower towards the east and north. Whatever may have been the surface features of the earlier glaciation it was the last one, the Wisconsin, which formed the present landscape. It was the water melting from the dying stages of this glacier that first filled the Great Lakes as we know them, that carved out most of the present stream valleys and laid down the lacustrine clays of the most productive agricultural areas.

The climatic environment of Southwestern Ontario again presents great contrasts. Situated in the middle of a large continent, the area has a great range of temperature from winter to summer, but these extremes are modified by the presence of the surrounding lakes. The average January temperatures are 20°F., the average July 69°F.⁴ These figures do not reveal the true climate, for this is an area of the greatest variability of weather. There can be greater changes of temperature from day to day than from season to season. Out-surges of cold dry polar air masses can be replaced by warm moist Gulf air overnight in any season of the year, though of course the air masses are colder in winter than in summer. Precipitation comes both from the edges or fronts of these differing air masses and from the air masses themselves. An average of 35 inches of precipitation falls over the area annually and is spread regularly throughout the year. The effect of the lakes is also seen in the amount of precipitation, for air which moves into the area from any direction but northeast is forced to pass over water. The slight uplift caused by the land surface makes it drop the water it has picked up. In winter the precipitation falls as snow and there is a well developed "snow belt" on the lee side of Lake Huron. It extends parallel to the lake shore from Walkerton in the north to London in the south, where over 80 inches of snow falls every winter. Spring, the period between the leaf buds and the flower is a period of only about three weeks in this area. This rapid change from winter to summer conditions however allows a minimum average over-all frost-free period of over 140 days. This frost-free period is increased to 170 days in the southwest and 155 days in the Niagara Peninsula.⁵

The modified continental climate has allowed the growth of a climax vegetation of forest. These forests covered nearly all the area prior to the arrival of the farmer but now only 10.2 per cent of them remains.⁶ The trees are mainly of mixed coniferous and deciduous species, with a greater preponderance of softwoods in the north and hardwoods in the south. The Great Lakes forest, a pine, spruce, yellow birch, maple association is the normal vegetation of the whole area. South of a line drawn from Toronto to Grand Bend on Lake

³L. J. Chapman and D. F. Putnam, *The Physiography of Southern Ontario* (Toronto, 1951), 11 ff.

⁴Canada, Department of Transport, Meteorological Division, *Climatic Summaries for Selected Meteorological Stations in the Dominion of Canada* (Toronto, 1947) 14, 36, 50.

⁵D. F. Putnam and L. J. Chapman, "The Climate of Southern Ontario" (*Scientific Agriculture*, XVIII, April, 1938) 401-406.

⁶Canada, Bureau of Statistics, Census Division, *Eighth Census of Canada, 1941* (12 vols., Ottawa, 1947), VIII, 1020-1047.

Huron, a tolerant hardwood association including black walnut, chestnut, tulip tree, magnolia, papaw and sycamore forms the Southern Hardwoods. The line represents the northern limits of these species.⁷

Under the original forest cover developed a soil which, under a general classification, is a grey-brown podsol.⁸ Varieties of slope, aspect, parent material and drainage have so influenced the soil formation processes that as a whole the terms colour, texture and structure are better indicators of the agricultural capabilities of the land. Slightly acid clay loams and sands form the most productive land.

Within the geographical region of Southwestern Ontario there seem to be two main occupations, farming and manufacturing, or growing and making. These two occupations are, from the point of view of their products, functionally connected. But, at the same time, there are major distinctions between them. Farming is carried out using mainly local raw materials of soil and climate, manufacturing in this area is based upon imported materials using only local power supplies in its operations. Hence a great emphasis is placed upon transportation facilities from an industrial viewpoint. The second distinction is in the amount of land required. Farms are large land areas with relatively low capitalisation. Factories occupy small land areas with high capitalisation. The delimitation of the industrial area cannot, however, be made at the edge of the factory, for then it would be impossible to map them. Every industry is the centre of a much larger area of land over which its influence is felt. Within this area live its employees, and those engaged in supplying the services for them. The limits of the area are set by the distance the worker is willing to travel each day to get to work: or more accurately the time a worker is willing to spend, for accessibility is measured not in distance but in time. Thus, around the industrial centres are grouped suburban sprawls and dormitory villages interrupting the agricultural use of the land and altering its use-classification from rural to urban.

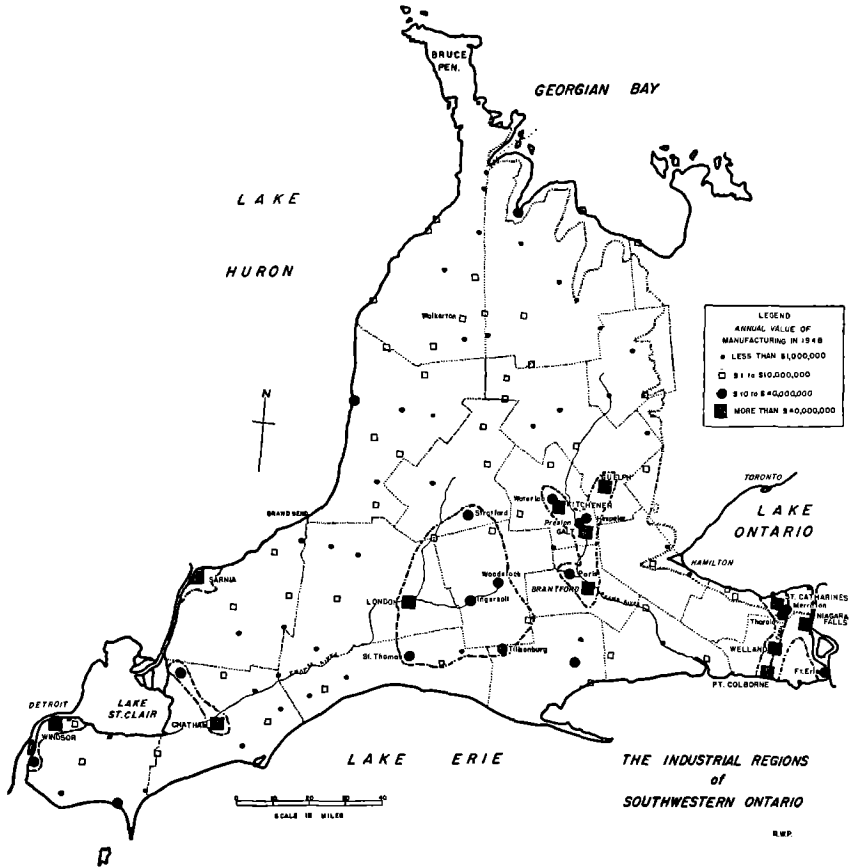
There appear to be six major industrial regions in Southwestern Ontario, each one existing because of, and dependent upon, a particular local advantage. The criteria of industrial density and interconnection have been used in outlining the areas.⁹ The Windsor region, in the southwest, is dependent upon the water transport of the Detroit River and Lake St. Clair and especially upon the presence of the city of Detroit on the right bank of the river. In fact the whole city of Windsor is little more than an overflow of Detroit with automobile factories built to by-pass the Canadian tariff barrier.

In the west the Sarnia area is a result of the cheap transportation of raw materials by lake boat and of unlimited supplies of cold, unpolluted water from Lake Huron. The so-called "Chemical Valley" is in the process of rapid expansion with oil refining and synthetic rubber the chief products.

⁷Canada, Department of Mines and Resources, *Native Trees of Canada* (Ottawa, 1949), map.

⁸P. C. Stobbe and A. Leahey, *Guide for the Selection of Agricultural Soils* (Ottawa, 1948), 8-9.

⁹Canada, Bureau of Statistics, General Manufacturers Section, *Geographical distribution of the manufacturing industries, 1948* (Ottawa, 1951), 23-34.

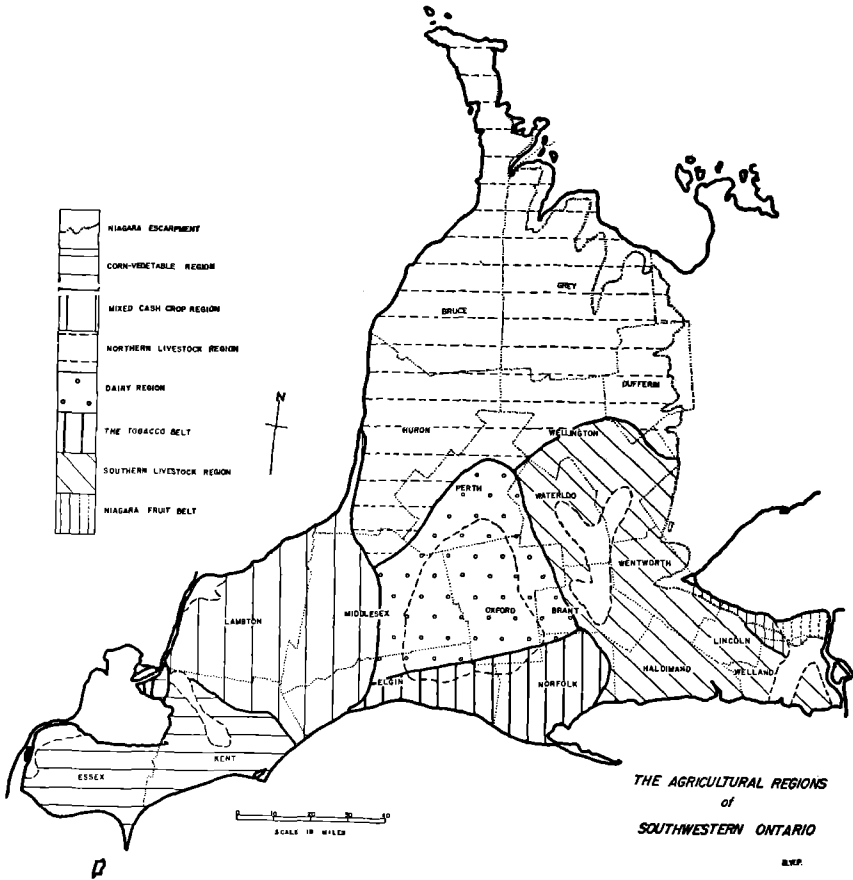


Immediately east of Lake St. Clair is the Chatham-Wallaceburg region. The geographical basis of both these towns was originally access, by water, to the Great Lakes system via the Thames and Sydenham Rivers. Modern rail and road routes now supplement canal boats.

In the central counties there is a wide scattering of industrial towns, no pair of them being less than nine miles apart. These towns, London, Woodstock, Stratford, St. Thomas, Ingersoll and Tillsonburg began as agricultural service towns but, once they were joined by a dense network of railway lines, developed into processing and manufacturing towns. The six towns produced 12 per cent by value of all the manufactured products of Southwestern Ontario in 1948. Though these cities form a region they are well integrated with an agricultural hinterland. The basis of this region is mainly location, flanking and on, the east-west rail network.

The fifth manufacturing region lies along the valley of the Grand River and its tributaries. It stretches from Guelph in the north to

¹⁰*Ibid.*



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Brantford in the south, including the cities of Kitchener-Waterloo, Hespeler, Preston, Galt and Paris. The original local resource of water for power and nearby lumber for raw materials has been replaced by hydro-electricity and imported vegetable, animal and mineral products for textiles, leather goods and machinery.

In the southeast of the Niagara peninsula occurs the Welland Canal complex. It includes the cities of Welland, St. Catharines, Meriton, Thorold, Port Colborne, Niagara Falls and Fort Erie. The dual basis of this complex is the hydro-electric power development from the falling waters of the Niagara River, and the Welland Canal which allows easy access to raw materials and markets through the Great Lakes system.

It will be noted that all these industrial regions lie in the southern part of the region though there is a regular pattern of medium sized "middle towns."¹¹ with an agricultural aspect throughout the whole

¹¹N. M. McArthur, *Industrial Development in Towns of the London Area* (M. A. Thesis, Department of Geography, University of Western Ontario, 1950), 150-155.

region. Out of a total dollar value of production of \$2,056,000,000 in 1948, \$1,726,000,000 or 84 per cent was produced in the industrial regions outlined above. This is slightly more than the value produced by the Toronto Metropolitan area where there are 4,005 manufacturing establishments as compared with 1,840 firms in these decentralized regions.¹² This suggests perhaps that unit productivity is higher in the smaller cities than in the large modern con-urbations.

The remainder of the land area of Southwestern Ontario is in agricultural use. Of the 149,920 farms in Ontario 75,697 or nearly half are in this area.¹³ These farms produce 78 per cent of all the field products and 70 per cent of the vegetables and fruits of Ontario. Typical of this region is specialized cash crop farming with an increasing tendency towards larger farm units and greater use of farm machinery. The products of the farms have two main destinations either to nearby industrial areas as food supplies or to the "middle towns" for processing for distant markets.

There seem to be seven main agricultural regions within the topographic limits of Southwestern Ontario.¹⁴ In the southwest, the flat, poorly drained, lake-deposited clays of Kent and Essex Counties form the major corn growing area. This is the most favoured climatic area in Canada, the only one in which corn can be grown on a large scale. Along the Lake Erie shore and near the cities are narrow zones of market gardening. It is axiomatic that near large city markets any land is good market gardening land because low transportation costs to nearby markets and the higher value of fresh perishable products allow an artificial fertility to be created in the soil.

To the east of the corn belt lies an interesting region about 50 miles wide stretching from Lake Erie to Lake Huron. In this area the general economy is mixed farming, with specialty cash crops taking up the largest acreage. The exact crop that is grown on any specific farm in any one year depends more upon prevailing prices, price supports, demand or individual whim than upon a geographical condition. This is an area where corn, sugar beets, oats, wheat, turnips, flax, barley or forage crops can be grown. These crops compete for acreage each year, a factor which makes planned conservation rotations quite unusual.

In the southern portion of Norfolk County and adjoining portions of Elgin, Brant, Oxford and Haldimand Counties the retreating Ontario-Erie lobe of the Wisconsin glacier left behind a large spread of sands and gravels, chiefly in a delta form although some remain as sand dunes and lake shores. On this sand, the natural vegetation was grass or pine forest. The soils are sands and sandy loams, slightly acid but well drained, and low in organic content. The agricultural use of the soils was, until 1928, limited to rather poor mixed farming and stock raising. By that date their use for growing flue-cured tobacco was realized. To-day these farms have the highest dollar value of any

¹²Canada, Bureau of Statistics, General Manufactures Section, *Geographical distribution of the manufacturing industries*, 1948, (Ottawa, 1951), 34.

¹³Canada, Bureau of Statistics, Census Division, *Ninth Census of Canada*, 1951 (Ottawa, 1952, Bulletin 6-5) 1-4.

¹⁴S. C. Hudson, R. A. Stutt, W. M. Van Vleit, J. L. Forsyth, *Types of Farming in Canada* (Ottawa, 1949, Department of Agriculture, Publication 825), 61-62.

in Southwestern Ontario. The only similarity between tobacco culture and the general farm economy is a dependence upon weather conditions for growth and harvest; and even these can be partially controlled by intensive irrigation. The soil is used only as footing for plants. Organic matter, artificial fertilisers and water are added. The plants themselves are grown from seed in greenhouses, then transplanted. Cultivation is by hand or by horse-drawn machinery; harvesting is a hand operation requiring a large temporary mobile labour force. Tobacco growing is almost a factory operation and should be considered as such.¹⁵

To the north of the Tobacco Belt and centred on Oxford County is a region of dairy farming. The land surface is mainly rolling moraines and undulating clay plains inherently suited to pasture and fodder crops. The climate is moist and mild but much more important factors are the large consumer markets for fluid milk of the Central and Grand Valley industrial areas and the rapid transportation routes for the milk surplus to the processing plants for butter fats, cheese, and evaporated products.

To the north and east of the Dairy Region lies another area of what is essentially a mixed farming zone. However, it differs from the western mixed farming region since it grows very few cash crops. Cash income is obtained chiefly by the sale of livestock and livestock products. Beef and dairy cattle, swine and poultry are the most important. Throughout the Northern livestock area are found part-time and self-sufficing farms, particularly in the Bruce Peninsula and along the edge of the escarpment. There are several areas of specialty crops especially apples, along the Georgian Bay lowlands.

In the eastern part of Southwestern Ontario lies a much more commercialised stock raising area extending from Guelph in the north to the Lake Erie shore. It is an area which changes from moraines and drumlins in the north to flat clay plains in the south. A concentration upon local markets with an emphasis on vegetables is an added feature of this economy.

Although not strictly included within my original designation of Southwestern Ontario a few words about the area between the Niagara escarpment and Lake Ontario may not be out of place. Here is to be found the southern extension of the Ontario Fruit Belt. Here are grown over half of the tree fruits and small fruits of the province.¹⁶ The sloping land, the well drained former lake beaches and the lower elevation tend to make the region warmer, less susceptible to frost and wind damage than anywhere else in Canada. It is an area of very intensive land use and in addition has the advantage of a great pool of part-time or seasonal labour from the nearby industrial complex.

¹⁵R. C. Vance, *Tobacco Economy and People of the New Belt* (M. A. Thesis, Department of Geography, University of Western Ontario, 1952), 1-22.

¹⁶Canada, Bureau of Statistics, Census Division, *Ninth Census of Canada 1951* (Ottawa, 1952, Bulletin 6-6) 1-8.

The importance of Southwestern Ontario to the economy of Canada cannot be too greatly stressed. It lies across the main transportation routes with access both east and west and north and south. It is the industrial area which can most easily feed itself. It has local supplies of hydro-electric power and increasing reserves of natural gas. The future development of the St. Lawrence Seaway can only accelerate its growth.