

**ESQUEMONG TOWNSHIP
A GEOGRAPHICAL APPRECIATION**

by

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The section of the land use map contained within the boundaries of the Credit Valley Watershed was surveyed by the author under the auspices of the Department of Planning and Development, Conservation Branch. It is by their kind permission that it has been included in the present land use map (figure 14) - Land Utilization in Esqueping Township.

The author also wishes to thank the many inhabitants of Esqueping Township and the municipalities of Georgetown and Acton who provided so much of the information presented in the thesis.

And lastly, thanks are due to Miss Lois Mackenzie who so patiently typed this thesis.

INTRODUCTION

This thesis is primarily a study of the geography of a township. That is, a treatise presented to give a full geographical appreciation of the area under study.

Geography is essentially a study of distributions, their relationships with a view to areal differentiation. I will attempt to present an understanding of these three elements, that comprise the field of geography, as they apply to Esquesing Township.

The first two aspects of this definition are comparatively straightforward but it is the final aspect, that of areal differentiation, that presents the greatest problem in a thesis of this type. However, an attempt will be made to delineate definite geographical regions within the township by means of an interpretation of the present land use.

In order to do this, I will first present the physical background to be followed by a study of the historical geography of the township. Consequently, the physical basis, along with the evolutionary processes of land use will be presented to provide an understanding of the present land use and, if possible, the delineations of geographical regions.

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LOCATION, SIZE AND SHAPE

Little is required to describe the position, size and shape of Esqueusing Township other than a study of the location map (see figure 1) and a few initial facts of orientation.

The area under study covers 66,778 acres or approximately 104 square miles and is roughly rectangular in shape with the sides measuring 11.8 miles by 8.8 miles. Georgetown and Acton are the main urban centres with the village of Stewarttown holding the township seat.

Esqueusing Township is on a main line of the Canadian National Railways - Toronto-Sarnia Division, in addition to the Hamilton-Allendale Division, both of which cross at Georgetown. The Canadian Pacific Railways traverses only a small section of the township on its way to and from Milton, the county seat situated in Trafalgar Township.

The entire area is close to the core of the greatest marketing area in Ontario, both for agricultural and industrial products. The city of Toronto lies thirty miles to the east while Hamilton and Guelph are thirty miles to the south and fifteen miles to the west respectively. A circle with a fifty mile radius¹, drawn with Esqueusing Township as its centre, would enclose one-half of the population of Ontario, roughly one and one half million

people. The effect of this position within such a densely populated area is illustrated in the following diagram.....
¹ Halton Chamber of Commerce. The County of Halton. - a small pamphlet published in 1948.

populated area is clearly reflected in the land use - a subject which will be considered in subsequent chapters.

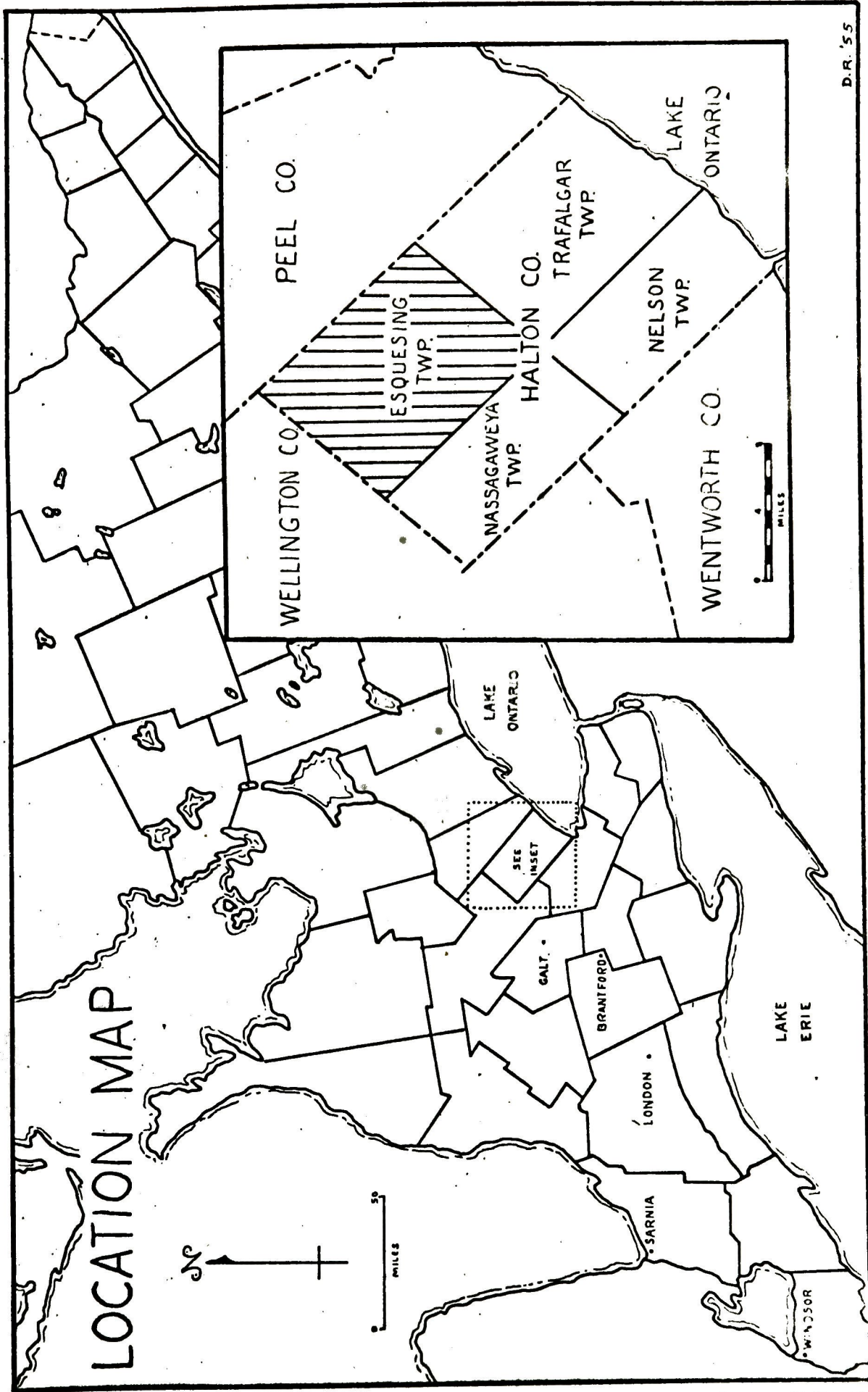
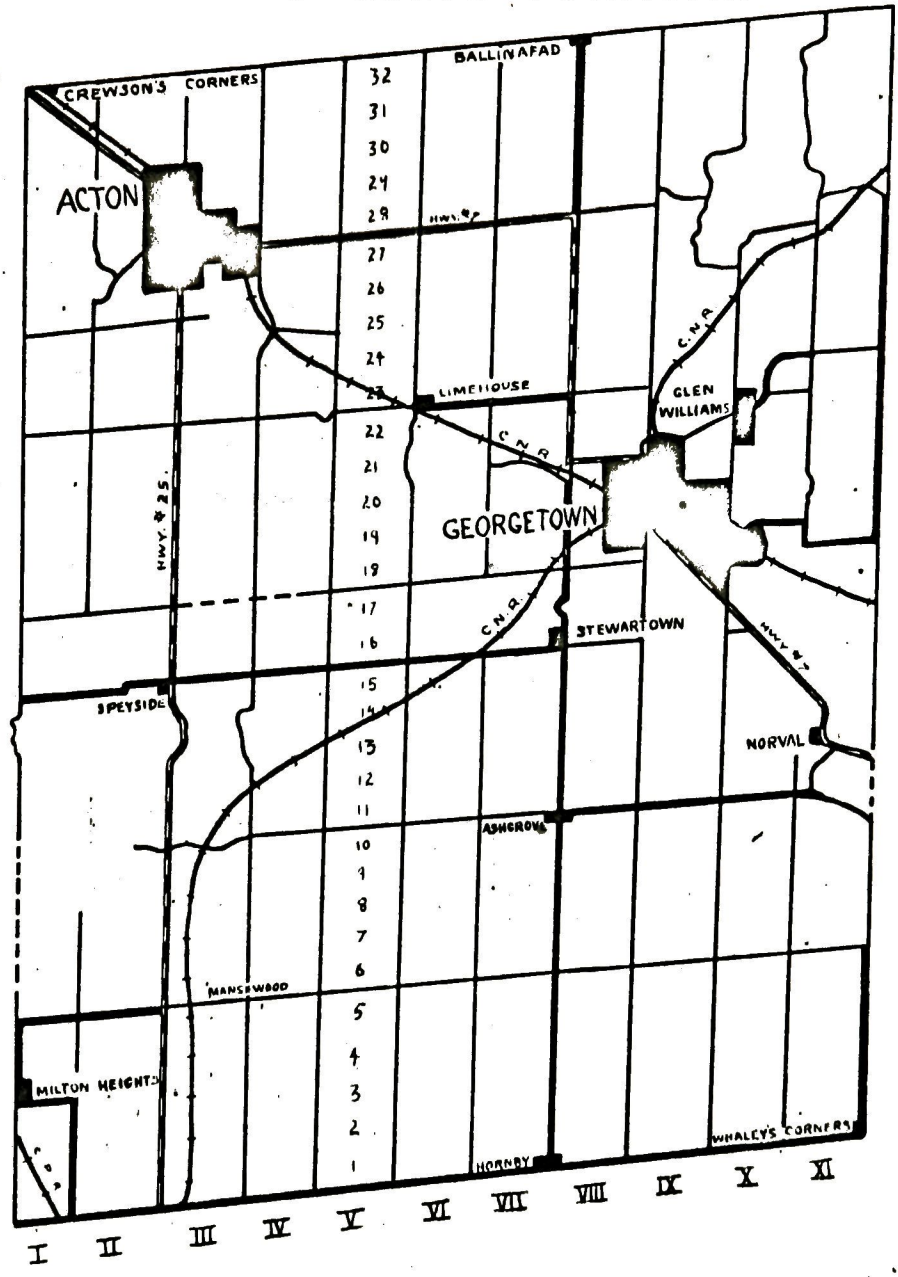


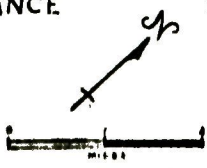
FIGURE 11

INDEX MAP ESQUESING TOWNSHIP



LEGEND

- | | | | |
|--|-----------------|--|----------------|
| | QUEEN'S HIGHWAY | | RAILWAY |
| | COUNTY ROAD | | URBAN |
| | TOWNSHIP ROAD | | LOT NO. |
| | ROAD ALLOWANCE | | CONCESSION NO. |



IR '55

FIGURE 2.

CHAPTER I
PHYSICAL GEOGRAPHY

(A) GEOLOGY

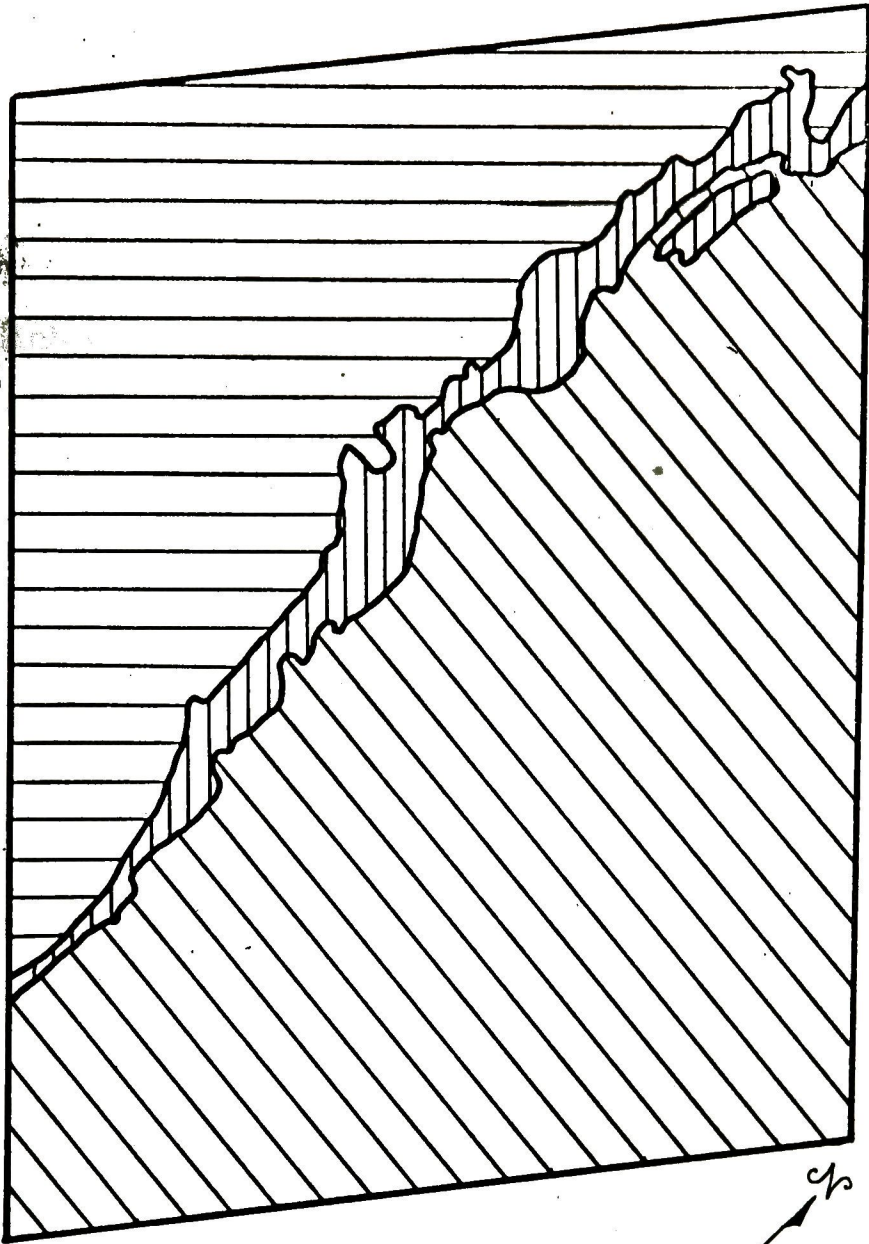
Palaeozoic Geology

The study of bedrock geology will necessarily be limited to those features which most directly influence the geography of the area. The materials laid down by the Palaeozoic seas have provided the debris which has been carried, deposited and reworked by the glaciers. However at this point I will mainly be concerned with describing the distribution, characteristics and relationships of the Niagara Escarpment which stretches in a north-south direction diagonally across the township. Because this feature forms one of the main physiographic divisions of the township and exerts such a strong influence on this geographical study, this section dealing with Palaeozoic Geology will be almost entirely associated with this pre-glacial feature.

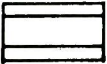


The Niagara Escarpment is directly a result of differential erosion that has been effective since pre-pleistocene times. It owes its present characteristics to the fact that it is composed of hard, resistant limestones and dolomites which cap the more easily eroded shales below. The weathering of these soft shales undermines the harder, upper layers which eventually break off and, in this way, preserve the steep front of the escarpment.

The uppermost stratum of the escarpment (or the

PALÆOZOIC GEOLOGY of ESQUESING TOWNSHIP



LEGEND

- | | | | |
|---|-----------|-----------|--------------|
|  | LOCKPORT | FORMATION | } SILURIAN |
|  | MEDINA | FORMATION | |
|  | QUEENSTON | FORMATION | } ORDOVICIAN |

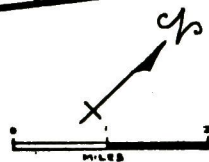


FIGURE 3.

most recent palaeozoic deposit) is composed of the Lockport formation.¹ It forms a thick series of magnesium limestone or dolomite, commonly coloured light grey to blue and where exposed it is usually weathered to a light grey or even white. It was this formation that has been so extensively utilized in Esquesing Township for the manufacture of lime.

Immediately below the Lockport, lies the Medina formation which was deposited under Silurian seas in a similar manner. It is composed of a number of members (viz. Whirlpool, Manitoulin, and Cabot Head) which have been combined into a single map unit (see figure 3). These strata are exposed along the front of the Niagara Escarpment and are comparatively flat-lying but vary in thickness from place to place.

The Cabot Head member lies between the Manitoulin member below and the Lockport formation above, and may be seen to advantage at Limehouse in the Canadian National Railways' cut. (Concession VI, Lot 22). This stratum is composed essentially of dolomitic limestone and was utilized similarly to the Lockport formation for the source of lime by the early kilns which dot Esquesing Township.

In the same manner, the Manitoulin member which immediately underlies the Cabot Head member has been utilized in the lime kilns. This stratum consists of grey, somewhat argillaceous magnesium or dolomitic limestone, disposed in

¹ Descriptions of these various deposits have been taken from Caley, J.F., Palaeozoic Geology of the Toronto-Hamilton Area. Canada, Dept. of Mines and Resources. Geological Survey, Memoir 124, 1940.

fairly even beds from two feet to eight feet in thickness, and where exposed, weather to a buff colour.

The oldest member of the Medina formation, the Whirlpool member, has been as equally important economically as the Lockport formation--to-day it is even more so. The Whirlpool member is composed of approximately twenty-five feet of quartzose sandstone resting directly upon the Queenston formation and has been extensively utilized by the many small quarries of Esqueping Township. Where exposed, it consists of brownish red, mottled, and light grey sandstone disposed in beds from one foot to four feet thick. It is this rock that is described commercially as the "Medina Sandstone" or the "Credit Valley Sandstone". The upper sections of the deposit are commonly crossbedded and are unsuitable for building purposes. The lower sections are particularly suitable however, as they easily split into two or four inch slabs.

An outlier of this Medina formation is found in the northern part of the township. Several explanations have been presented to account for its occurrence, but the one most generally accepted is that it has been separated from the main body by erosion. It is believed that during pre-glacial times, a river flowed along the front of the Silurian deposits. Through some structural weakness, this river eroded behind the front of the formation, undermining the resistant Lockport stratum until it caved in and was subsequently removed. As a result, one finds this "island"



Photo No. 1. A view of the Niagara Escarpment as seen from the Esquesing-Nassagaweya Township line.



Photo No. 2. Arrow points to the Silurian outlier that occurs in the northern part of the township. Face of the escarpment proper is seen in the background.

of Silurian strata set directly upon the Ordovician deposits but distinctly separated from the escarpment proper by a narrow valley now occupied by a stream.

The oldest Palaeozoic deposit affecting Esquesing Township, but the most recent formation of the Ordovician seas, is the Queenston formation. This formation most directly affects the area under study only at the base of the Niagara Escarpment, for it is here that these red shales are not entirely covered by pleistocene deposits.

The strata consists of brick red, thinly bedded, sandy and argillaceous shale. Almost everywhere it is scamed by narrow greenish bands, resulting from the bleaching action of percolating waters charged with organic acids in solution. When exposed to the atmosphere, the Queenston shale rapidly breaks down to form a fine, reddish, clay soil, easily eroded since it is usually combined with rather steep slopes.

At present, the Queenston shale is the most widely used deposit of the brick and tile industry of Ontario. Because of its accessibility, homogeneous physical character, and its ability to be easily mined and crushed, this material is extensively utilized by the aforementioned industry. It develops excellent plasticity when mixed with water, a property rendering it particularly suitable for the manufacture of wire-cut bricks, hollow building blocks and field drain tile.

Consequently, one cannot help but realize the multifold influence that the palaeozoic geology of Esquesing Township has had on "the study of distributions and their

relationships". However it is easily seen, that the main reason for this strong influence, is the presence of the Niagara Escarpment. The accessibility of these various strata provided by this erosional feature, has made possible their economic exploitation by the various industries of Esquesing Township.

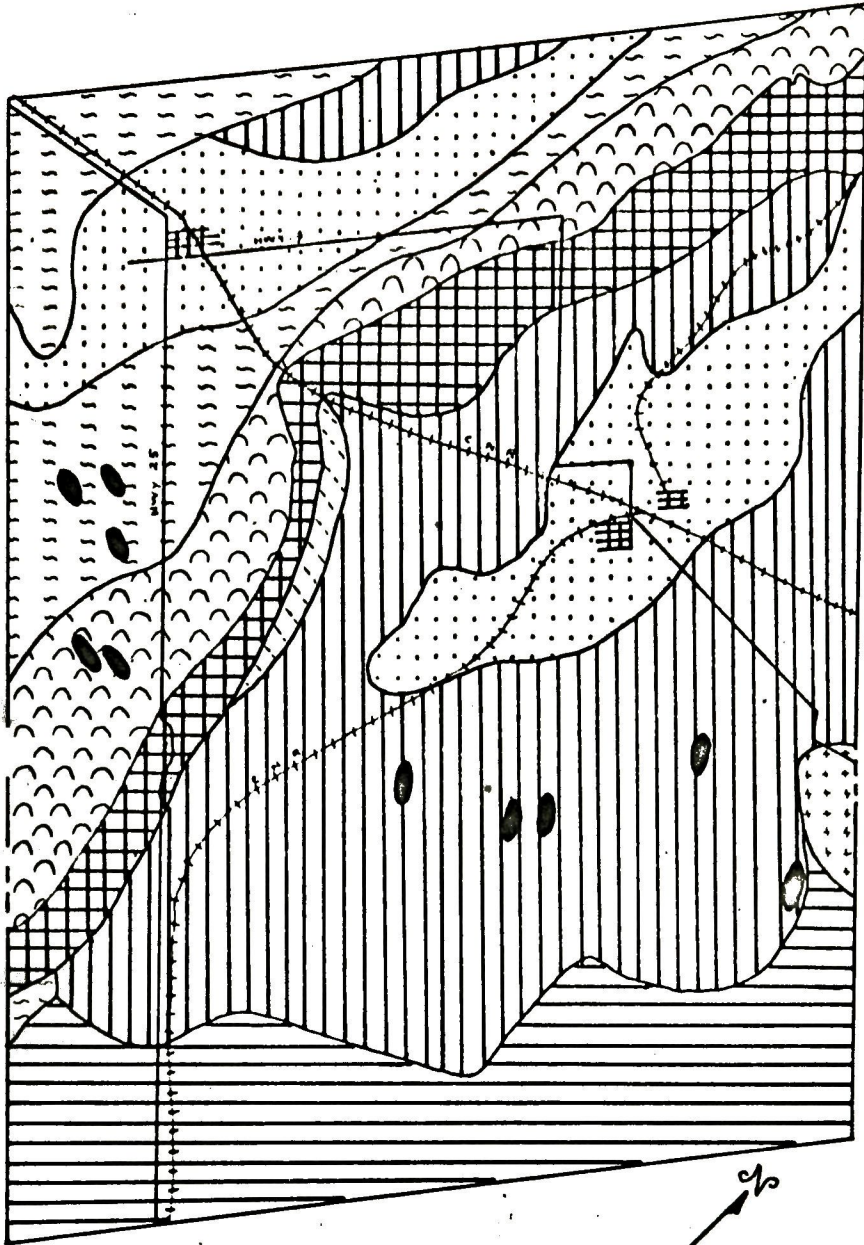
In conclusion, we may say that the direct influence of the palaeozoic strata greatly affects the area under study. However, because of the pleistocene deposits that cover most of the township, this influence is limited to the narrow band formed by the physiography of the Niagara Escarpment and its bordering areas of limestone plain and Queenston shale. Agriculture, industry, transportation and drainage are all directly influenced by this feature.

Indirectly, the effect of these palaeozoic deposits is also significant. It is this bedrock that has been eroded, carried (but only for a short distance), and redeposited by glaciers to provide the parent material upon which the present soils have developed. In Esquesing Township, the shaly nature of the till has resulted in the development of soils more acidic than the majority of those found in Southern Ontario. Consequently, a distinct problem is presented to the agriculturalists of the area.

Pleistocene Geology

In describing the physiography of Esquesing Township, I must make it clear that I am simply "building

PHYSIOGRAPHY of ESQUESING TOWNSHIP



LEGEND










- | | | | |
|---|---------------------|---|--------------|
|  | LIMESTONE PLAIN |  | ESCARPMENT |
|  | BEVELLED TILL PLAIN |  | SPILLWAY |
|  | FLUTED TILL PLAIN |  | SAND PLAIN |
|  | SHALE PLAIN |  | TILL MORAINE |
|  | DRUMLIN | | |

FIGURE 4.

upon" the classic work of Putnam and Chapman.¹ I have utilized their basic concepts and have applied them to Esquesing Township in an attempt to explain the distribution of these physiographic features. I have accepted the boundaries that they have indicated on their accompanying map (see figure 4), but I have somewhat enlarged on the geological processes that have effected Esquesing Township. During my field work, I found only one feature that these authors neglected to map, that is, the small section of sand and gravel around Concession III, Lots 10 and 11.

In order to fully understand the distributions of the physiographic divisions, their characteristics, and resulting interrelationships with soils and land use, an attempt will be made to explain the geological evolution of the pleistocene deposits of this area.

Initially, it must be understood that the entire area under study has been subjected to continental glaciation. The advance and recession of the most recent glacier (Wisconsin) has provided the complexity of physiographic divisions found in figure four.

The Ontario lobe which formed during this ice age was the ice sheet that most directly effected Esquesing Township. According to Putnam and Chapman this mass of ice advanced from the vicinity of Lake Ontario, moving in a north-westerly direction to cover all of the area under

¹ Chapman.L.J. and Putnam.D.F. The Physiography of Southern Ontario University of Toronto Press: 1951.

study. During this advance, several of the present landforms were constructed, although most of them have been modified during and since its subsequent recession.

As the Ontario ice lobe moved forward, it plastered till¹ on the existing surface features to form the sections of till plain found to the east of the escarpment. The variation between the bevelled till plain and the fluted till plain did not occur until the recession of the glacier.

During this advance, for some unknown reason, certain localized areas were covered with more till and consequently gave rise to definite drumlinized forms. In Esquesing Township they are elongated formations of slightly higher elevation than the surrounding area. They indicate the direction of the movement of the Ontario ice lobe, in that their long axis lies parallel to the direction of the flow of ice and the steep end faces the direction from which the glacier advanced.

As the ice lobe continued in its north-westerly advance, it came in contact with the Niagara Escarpment - the pre-glacial erosional feature. The escarpment had little effect upon the irresistible movement of the glacier other than to locally change the direction of a small portion of this ice lobe to a more westerly course. To support this argument of the escarpment effecting a slight

¹ Appendix.A. Depths of Pleistocene Deposits over Palaeozoic Bedrock.

change in the direction of glacial movement, I would like to indicate the cluster of drumlins found on Concessions I and II, Lots 18 to 23 which have had their alignment altered in a more westerly direction than those found below the escarpment (see figure 4).

As the glacier continued its advance over the brow of the escarpment, it swept the uppermost section clear of any existing debris. In this manner, the limestone plain of Esquesing Township was formed. Here the overburden is shallow and covered with pieces of dolomitic limestone. In many sections, the covering of any type of till is almost non-existent.

The only remaining feature formed by the advancing glacier that necessitates attention at this point, is the small section of fluted till plain found extending roughly from Concessions III to VII and including Lots 30 to 32. The formation of this feature is similar to the fluted till plain found to the east of the escarpment.

The ice lobe continued its westerly movement beyond the borders of Esquesing Township, and it is the effects of its subsequent recession to which I will now turn.

The retreat of the glacier was marked by recurring cold periods during which the ice lobe re-advanced, overriding the recently deposited drift and building a moraine at the terminus of each advance. It was during the second longest halt of the receding Ontario ice lobe that the till moraines of Esquesing Township were formed.

During a period of stagnation, when the glacier was neither advancing nor retreating, the surplus run-off water drained along the face of the ice lobe forming a spillway and depositing the sands and gravels upon which the town of Acton is now located.

Again the glacier continued its retreat, only slightly modifying the previously formed glacial features. It was at this time that the formation of the spillway, in which the town of Georgetown is now located, occurred. According to Putnam and Chapman, meltwaters from an ice lobe near the Lake Simcoe area, drained along the face of the escarpment, depositing a discontinuous train of sand and gravel until it entered Lake Warren below Campbellville (Township of Nassagaweya).

Because of this discontinuity of deposition, the Georgetown spillway appears to end near Concession V, Lots 16 and 17. However, while working in the field for this thesis, another section was found which appears to be part of this discontinuous deposit. This is the only explanation that I can present to explain the occurrence of a fairly large section of sand and gravel in Concession III, Lots 10 and 11. Putnam and Chapman have neglected to map this section (see figure 4).

The last affect that the receding glacier imposed upon the physiography was in the formation of the famous Peel Ponding. This ponding has resulted in the distinction being made between the fluted till plain and the bevelled

till plain. It may simply be described as an impounded post-glacial lake. The meltwaters of the receding glacier were dammed up forming a shallow lake whose wave action "bevelled" the section of the fluted till plain that it covered.

The Norval Sand Plain has been described by Putnam and Chapman as being formed by deltaic deposition resulting from the Croft River flowing into this Peel Ponding.

Man's adjustment to these physical features will be dealt with in subsequent chapters. At this point, it simply remains to describe the physical characteristics found within these physiographic divisions.

Till Moraines

In Esqueping Township there are two separate till moraines, each one being part of a separate moraine which extends for some distance outside of the township under study. The one to the south of Acton is part of the Galt moraine while the Paris moraine provides the section found to the north of the previously mentioned town. Both are composed generally of a ridge of till, characterized by a great many knobs, depressions and sharp, abrupt slopes. Since there is actually very little difference between these two moraines, they provide parent material for the development of similar soil profiles.

Spillways

The spillways in the area under study provide the usual appearance of a broad trough, floored wholly or in part

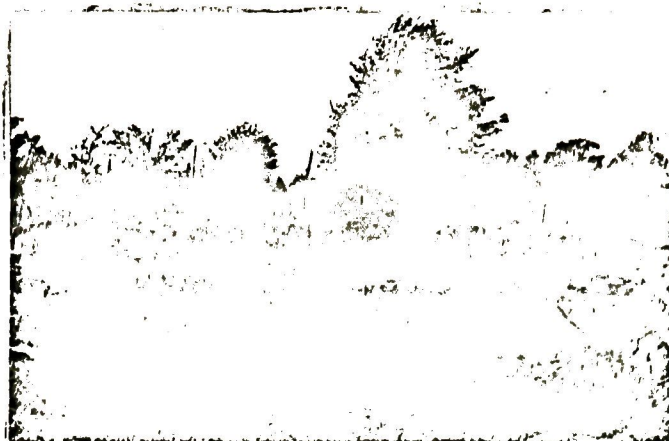


Photo No. 3. Limestone Plain. A physiographic unit upon which large sections of Class VI land have developed.



Photo No. 4. A severely eroded section of Queenston shale showing the narrow greenish bands, thought to be a result of the bleaching action of percolating waters charged with organic acids.

by gravel beds often arranged in terraces. In each case, the bottom of the valley is covered in many places by a cedar swamp. Although one often finds a river or stream occupying the floor of the spillway, the Acton Spillway, "whose form is unsurpassed in southwestern Ontario"¹ has only a small stream flowing along its bottom. The Georgetown Spillway, on the other hand, is occupied in part by the Credit River and tributaries to the Credit.

Each spillway provides the physical site for the two largest urban centres in the township and in addition provide a plentiful supply of sand and gravel. However, it is only the Georgetown Spillway that has been and is being commercially exploited for that resource. This fact may readily be explained simply because of the presence of the Credit River which supplies the necessary water for the washing of the deposits.

Limestone Plain

This area, immediately along the brow of the Niagara Escarpment, has been swept clear, or nearly clear, of overburden. The surface is usually liberally sprinkled with blocks of dolomitic limestone while many swampy sections partially cover this feature. Soils are shallow and droughty and usually remain under vegetative cover.

Fluted Till Plains

These plains are made up of a loamy till which

¹ Op. Cit. Chapman. L.J. and Putnam. D.F. P.48.



Photo No. 5. Typical small drumlin found on the Fluted Till Plain.

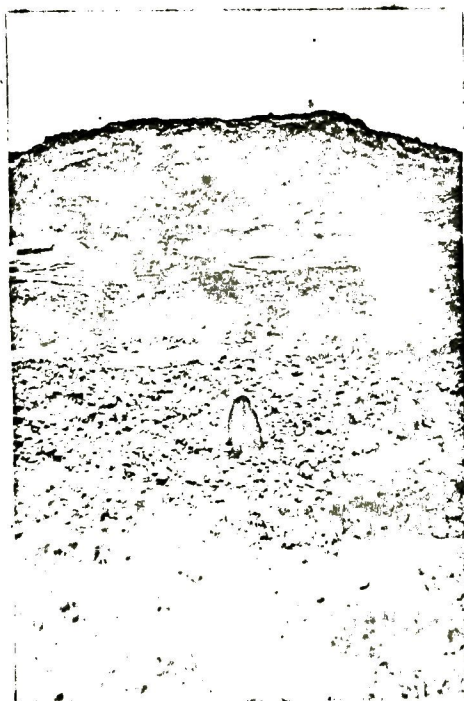


Photo No. 6. Typical glacioluvial deposits, irregularly bedded, as found in the Georgetown Spillway.

has been plastered to form an area of slightly rolling relief. The section found to the east of the escarpment was not subjected to the "beveling" action of the Peel Ponding.

The soils formed on this feature are predominately of a clayey texture while problems of drainage occur between the elevated sections. Because much of the till has been derived in part from the Queenston shale, the soils that develop are less calcareous than most in Southern Ontario.

Bevelled Till Plain

This is the section that has been modified by the Peel Ponding and, as a result, the relief which characterizes the fluted till plain is not present. The term "bevelled" simply refers to the modification of the fluted till plain that resulted as the waters of the Peel Ponding eroded the tops of the hills and filled the hollows with clay.

Shale debris also characterizes the till of this section, and other than a few variations imposed by drainage, the land use of these two till plains shows very little differentiation.

Shale Plain

This feature is found at the foot of the escarpment between Limehouse and Lot 16. It is simply an exposed portion of Queenston shale and has a limited agricultural utility as it gives rise to infertile, easily eroded soils.

The drumlins, sand plain and escarpment have all been discussed in the section describing the geologic



Photo No. 7. Bevelled Till Plain. A physiographic feature resulting from the action of the Peel Ponding that once covered this area.



Photo No. 8. Fluted Till Plain. Note the slight irregularity of surface configuration.

evolution of the physiography of Esquesing Township. Little of significance could be added at this point.

It has been necessary to discuss the movements of the Ontario ice lobe to account for the distribution of the various land forms and to see their relationships to the resulting soils and subsequent land use.

(B) CLIMATE

Esquesing Township falls under W. Koepfen's classification as Dfb. That is, it is characterized by a cool climate with humid winters and cool summers. The average temperature of the warmest month must be under 71.6° F.¹ The area under study is alternately subjected to four main air masses: (a) cool, dry, polar air from the north; (b) pacific polar air that has become warmed on the western portion of the continent; (c) continental polar air returning quickly from the south, generally intermediate in character to (a) and (b); and (d) subtropical air, carrying by far the most water vapour and generally warm for the season.²

According to Putnam and Chapman³, Esquesing Township

¹ Trewartha, G. T., An Introduction to Weather and Climate. McGraw-Hill Book Co. Inc. New York. 1943.

² Connor, A. J., The Climate of Canada. Meteorological Division. Air Services Branch. Dept. of Transport. Canada 1950.

³ Putnam, D. F. and Chapman, L. J., The Climate of Southern Ontario. Scientific Agriculture 18:8. April 1938.

TABLE ONE

CLIMATIC STATISTICS - GEORGETOWN, ONTARIO

<u>Temperatures</u>	<u>Jan.</u>	<u>Feb.</u>	<u>Mar.</u>	<u>Apr.</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>Aug.</u>	<u>Sept.</u>	<u>Oct.</u>	<u>Nov.</u>	<u>Dec.</u>
Mean Maximum	26.7	27.3	34.4	50.9	64.2	73.9	79.6	77.5	69.5	56.8	42.5	30.4
Mean Minimum	12.3	11.6	20.6	31.8	41.8	51.1	56.2	54.5	48.2	37.3	28.5	17.5
Mean Daily	19.5	19.5	27.5	41.4	53.0	62.5	67.9	66.0	58.9	47.1	35.5	24.0
Extreme Max.	58	57	80	85	88	96	103	96	96	84	75	59
Extreme Min.	-29	-28	-13	-3	20	30	38	33	25	10	-2	-22
Precipitation												
Rain	1.13	0.99	1.58	2.14	2.84	2.72	3.03	2.62	2.50	2.47	2.13	1.26
Snow	14.6	13.9	10.6	3.4	0	0	0	0	0	0.7	5.1	12.3
Total	2.59	2.38	2.64	2.48	2.84	2.72	3.03	2.63	2.50	2.54	2.64	2.49
												Total
												25.42
												60.6
												31.48

Note: Precipitation figures from January 1885 to August 1946
 Temperature figures from February 1914 to August 1946

is found in a section of the country with a "southern exposure", in which the climate is somewhat milder than that of the regions to the north. However, being located where it is, this area is not subjected to the modifying influences of the Great Lakes.

The township under study has no marked wet or dry season and in most years precipitation is sufficient to support a diversified agricultural economy. Occasionally, Esqueping Township has suffered from mild droughts but generally precipitation is dependable.

The only long-term climatological station in this area is located on the municipal boundary line of the town of Georgetown and is presently being operated by K. Batkin. A statistical summary of the available figures may be found on page 24.

For the thirty-seven year period ending in 1950, the average frost free period was 135 days. May 18th is the average date of the last spring frost, although it has occurred as early as April 19th, and as late as June 9th. The average date of the first frost in the fall is September 30th, although it has occurred as early as September 12th and as late as October 29th.¹

Precipitation is usually sufficient to provide an area generally suited to dairying. This fact, along with the market provided by the proximity of large urban areas has.
.....

¹ Direct Correspondence with M.K. Thomas. Dept. of Transport, Climatological Section. Toronto.

resulted in dairy products providing one of the main sources of income from agriculture in Esquesing Township.

Before the completion of the field work in the summer of 1954, it was thought that the escarpment would cause some localized variation in climate and consequently affect land use - however, no definite proof of this fact was found. The only climatic variation provided by this physiographic feature was the occurrence of rapidly moving air along the face of the cuesta. Such a phenomenon is particularly conducive to the cultivation of the hardier tree fruits (apples and plums). An orchard of this type is found at the base of the escarpment on Concession II, Lot 11. However, undue emphasis should not be placed on this feature as being an important locating factor for agriculture - it should simply be remembered as an additional favourable climatic feature.

(C) DRAINAGE

Since the recession of the glaciers and subsequent withdrawal of the pleistocene lakes, the amount of erosion by water has been comparatively small. The courses of the present streams are determined by the valleys of the post-glacial rivers, the position assumed by the glacial deposits and the general tilt of the land.

The drainage pattern of Esquesing Township is of the dendritic type, flowing in a general south-easterly

direction to Lake Ontario. Sections of three main watersheds are found within the township under study; the Oakville creek, the Credit River and the Speed River Watersheds. Although the Speed River ultimately drains into Lake Erie, only a small section of this watershed occurs in Esquesing Township in which no permanent streams exist.

The Oakville Creek, on the other hand, roughly drains one-half of the township. The many tributaries of this creek find their source in the swampy areas that dominate the brow of the escarpment. As these streams cut through the fluted and bevelled till plains, they seasonally flood a considerable area of bottomland. Although this provides a definite impediment to cultivation, the abundant soil moisture provides an excellent environment for the growth of succulent grasses to be utilized for pasture.

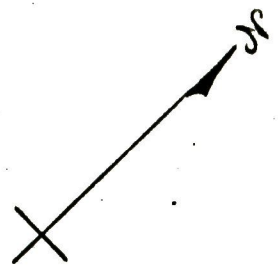
In addition to this, their utility must be appreciated by the fact that the stream valleys offer an excellent outlet for the tile drains by which the agriculturalist more efficiently utilizes his land. A more complete picture of their utilization by the early mills will be provided in following chapters.

The Credit River Watershed drains the other half of Esquesing Township. The river enters the area under study at Terra Cotta and leaves at Norval, swiftly eroding the soft drift until the Queenston shale forms its bottom. As a result of this comparatively swift erosion, the valley walls are steep and consequently form excellent dam sites.

SPEED RIVER

CREDIT RIVER WATERSHED

OAKVILLE CREEK WATERSHED



DRAINAGE PATTERN
of
ESQUESING TOWNSHIP

IR

FIGURE .5.

Gravel terraces are distinctly noticeable just to the north of Glen Williams. This fact supports the theory that this particular section was once occupied by the spillway which provided for the escape of glacial melt waters.

The Credit River and its tributaries have possibly been more fully utilized than the Oakville Creek for mill sites, but their influence is similar in providing excellent pasture and tile drain outlets. In addition, these waterways have been extensively utilized for recreational facilities but again, a complete picture of this relationship will be left to another chapter.

Silver Creek joins the Credit River at Norval and drains a section of the escarpment west of Georgetown and Stewartown. It has also provided mill sites and until very recently was directly utilized as the water supply for Georgetown. A section of this creek cuts directly through the urban plan of Georgetown, eroding the sandy soils of the spillway and profoundly affecting the physical site of that town.(see block diagram)

Although a complete picture of the utilization of these rivers and streams by man has not been completed at this point, the foregoing, combined with a study of the map,(figure 5), will provide a full picture of the drainage pattern of Requesing Township.

(D) VEGETATION

Halliday¹ includes the entire area under study in the Huron-Ontario section of the Great Lakes-St. Lawrence Forest Region. According to this author, the forest cover is characterized by the sugar maple² and beech association dominating the well drained sites. The black ash, white elm, red maple association, in addition to white cedar occupy the swamps and bottomland.

However, upon reviewing an extensive survey made by S. Benson³ in 1819, I could not help but notice continued reference made to the "massive, towering white pines" of Esqueusing Township, which seemed to dominate so much of his report. Concession by concession and lot by lot, as he surveyed the township he made an extensive but general description of the soils, relief and most significant here - vegetation. Since tall, straight pines were strongly in demand by the Royal Navy for masting timbers, it is possible that Benson somewhat overemphasized their occurrence. However he was not the only one that made note of their abundance, and even to-day white pines are found in more than usual quantities in Esqueusing Township. Indeed, the name

¹ Halliday, W.E.D. A Forest Classification for Canada
Forest Service Bulletin 89.

² Appendix B. Scientific Nomenclature of Vegetation.

³ Benson, S. Esqueusing Township: A description of the land
- a series of notes made by the author while
in the area.

Esqueusing has generally been accepted as meaning "The Land of the Tall Pines", translated roughly from Indian. The many stump fences that exist to-day again support this argument as they are predominately composed of the remains of white pine trees.

The explanation most generally accepted for the occurrence of white pine in such quantities has been the one presented by Putnam and Chapman¹ - "the till here (area immediately east of the escarpment in Halton County) is reddish due to the Queenston shale and consequently is less calcareous than most of the Southern Ontario tills. Perhaps it is this that attracts the pine trees."

In any event, although large white pines are still found, they are not of sufficient quantity to be of economic significance.

In Esqueusing Township approximately 16,500 acres or twenty-five per cent of the land is covered by woodlot. Their distribution follows the patterns provided by the steep slopes of the escarpment, the shallow soils of the limestone plain, the rough topography of the till moraines and the imperfectly drained bottomlands. A few sections of idle land have been permitted to revert to natural vegetation, but pioneer species such as paper birch, aspen or hemlock dominate.

Some excellent farm woodlots still remain in Esqueusing Township and an attempt was made to direct a traverse through the most characteristic ones. Although

¹ Op. cit. Chapman. L.J. and Putnam. D.F. P.57.

these woodlots are a valuable asset to the general prosperity of an area, in Esqueping Township only two woodlots are under the proper management to enjoy tax-exemption. The remaining woodlots provide tender shoots for grazing cattle during periods of drought.

Consequently, even a picture of the natural secondary growth is difficult to obtain. The following traverse descriptions are an attempt to show existing woodlot conditions and, at the same time, to show the relationship of vegetation to site.

The first traverse was directed through a woodlot underlain by till moraine (Concession II, Lot 32). Generally, the woodlot was a "maple bush" with hemlock, beech, cedar, paper birch and black cherry occurring in that order of importance. Because of the irregular surface configuration characteristic of till moraine, type differentiation was observed with slope position. Sugar maple and paper birch dominated the summit, the latter resulting from a comparatively recent cut-over. Hemlock and black cherry covered the imperfectly drained sections of the slope, while white cedar dominated the poorly drained bottomland.

The section of the Acton Spillway studied on Concession II, Lot 30 provided a typical example of the influence of a poorly drained area on vegetation. Actually, this woodlot provided a typical example of a "cedar swamp" in which white cedar, aspen and balsam poplar occurred in that order of importance. The understory was typically



Photo No. 9. A stump (or root) fence, built when stumps were pulled some years after the land was first cleared. For the most part they represent the remnants of the pine forest that once covered the township.



Photo No. 10. Road through a cedar swamp that occupies the poorly drained bottom of the Acton Spillway.

dogwood scrub, accompanied by representatives of the myriad of hybrid variation of willow.

The woodlot traversed on the limestone plain (Concession IX, Lot 31) had not been cleared because of excessive surface water, not because of excessive stoniness. As a result, the associations found were identical to those found on the Acton Spillway with one exception. This was the existence of white elm resulting from the lower water levels which occur during summer and fall.

Another section of the limestone plain was then chosen, this time one of a much drier site. Here, approximately three quarters of the vegetative cover was composed of sugar maple. Basswood was next in order of occurrence, interspersed with the odd growth of ironwood.

The forest cover of the escarpment (Concession VIII, Lot 27) showed interesting examples of local controls upon vegetative growth. From the top to the bottom there was a gradual sequence of associations, each in turn reflecting some localized influence.

The section traversed had a well drained summit and consequently, as might be expected, the sugar maple-beech association was found. As the traverse progressed from the top of the escarpment to the bottom, white oak became dominant along with yellow birch and basswood. Since Esquesing Township is somewhat peripheral to the section where white elm predominates, its occurrence at this particular location may be explained by the fact that insolation

provided by the south-facing escarpment is greater than on flat-lying areas.

Another local variation was found as the traverse approached the bottom of the escarpment where a "strip" of trembling aspen occurred. Since there was substantial evidence to prove that this section had been cut over, the trembling aspen was simply one of the initial trees to be established.

The poorly drained site at the bottom of the escarpment was typically covered by white cedar, with white elm growing on the imperfectly drained sides.

On the fluted till plain (Concession VI, Lot 20) a stand of timber was found, probably as close to a virgin stand as possible, if the report of S. Benson is to be accepted as being entirely unbiased. The elevated sections were dominated with large white pines while in the poorly drained depressional areas, white cedar abounded. Where there had been some cutting, poplar and hawthorne scrub had taken over.

On the bevelled till plain, examples of forest cover are practically non-existent except on the poorly drained areas. The woodlot traversed was being utilized by the farmer for the pasturing of his cattle. Natural regeneration was next to impossible, the young tender saplings providing forage during the droughty late summer.

In conclusion, one may readily see that drainage is the controlling influence in accounting for the local

variations in vegetative cover. On the poorly drained lowlands, cedar swamp dominates, with some willow and dogwood scrub. As the site improves in drainage, white elm is found progressing gradually into a hemlock-basswood association. The sugar maple-beech association dominates the well drained uplands.

White cedar and its associates are the most abundant species existing in Esquesing Township. This phenomenon may be simply explained by pointing out that the only areas not under cultivation at present are those that are poorly drained or too rough topographically.

(E) SOILS

The strongest determinants in the formation of soil are climate and vegetation. The soils of Esquesing Township have been formed under a moist, cool, temperate climate and a covering of a mixed forest, consequently, podzolization has been the principal soil forming process.

Locally however, the various soil differences are the result of depth, form and nature of the drift and soil drainage. The better drained soils may be grouped together under the Grey-Brown Podzolic classification, while the poorly drained soils belong to the Dark-Grey Gleisolic Great Soil Group, since they have a well developed "glei" horizon. Some soils, such as those known as muck and bottomland cannot be assigned to any particular

LAND CLASSIFICATION BASED ON SOIL CAPABILITIES



LEGEND

<u>Class I</u>	{ Oneida Silt Loam Oneida Clay Loam Woburn Loam	<u>Class IV</u>	{ Dumfries Loam
<u>Class II</u>	{ Chinguacousy Clay Loam	<u>Class V</u>	{ Jeddo Loam Lyons Loam Bottomland
<u>Class III</u>	{ Fox Sandy Loam Burford Loam	<u>Class VI</u>	{ Farmington Loam

IR. '55

FIGURE

Great Soil Group and are therefore termed - Intrazonal.

In the following section, the soils have been combined into a series of land classes in order to facilitate a general, applicable and comprehensible picture of their potentialities to be applied in a discussion on land use.

Class I

In this first classification I have grouped the soils known as Woburn loam¹, Oneida clay loam and Oneida silt loam into one. This combination provides the most suitable agricultural land in Esquesing Township. Oneida silt loam has the same profile as Oneida clay loam but there is a slight difference in the texture of the surface horizons. Although the former has slightly lower fertility, it is easier to work.

All three belong to the Grey-Brown Podzolic Great Soil Group and are characterized by a smooth to moderately sloping surface. In the case of the Oneida soils, the surface configuration is a result of stream dissection and the "fluting" action of the advancing glacier. The relief of the areas covered by Woburn loam is simply due to the rolling nature of the glacial deposits - stream dissection has played a role of minor importance.
.....

¹ Appendix C. Soil Profile Descriptions.

The Oneida soils tend to form predominately below the escarpment on the Fluted Till Plain, while the Woburn loam develops on the medium till to the west. Because of its development on the lighter textured, stonier parent material, Woburn loam has a lower inherent fertility.

All soils of this group are the well-drained members of their various catenas. Woburn has both good internal and external drainage. This external drainage combined with the smooth rolling slopes make it particularly susceptible to sheet erosion. The Oneida soils, on the other hand, have excellent surface drainage but the percolation of moisture through the profile is slow. Consequently they are more liable to gullyng.

There is also a difference in the texture of the till that provides the parent material for the various profile developments. The Oneida soils developed on a fine textured shale and limestone till, while Woburn loam has been formed from the same till but of medium texture. In both cases, however, the till is derived mainly from shale and only to a lesser extent from limestone materials. Consequently, the pH value of these soils tends to be low.

The A horizons of both are generally composed of six inches of dark brown loam with that of the Oneida's being somewhat more greyish and clayish than the Woburn. In both cases all horizons are well developed. Those of Oneida overlie a dark yellowish subsoil with a few stones, while Woburn

brown, shaley till.

The farmers of Esquosing Township have realized the adaptability of Class I to cultivation. Consequently, most of this land has been cleared and is continually cultivated. These soils are easily adapted to the growing of cereal grains, hay and pasture and consequently form a strong basis for the dairying and general farming practices of the township. The problems of erosion and constant applications of organic matter, phosphate and lime require constant attention.

Class II

Into this type I have allotted but one soil type - Chinguacousy clay loam. Although it closely resembles Oneida clay loam, drainage is a limiting factor in the capability of this soil. Actually, it is the imperfectly drained member of the Oneida Catena that has developed on the area once inundated by the Peel Ponding (Bevelled Till Plain). Consequently, surface relief is less than that of Class I and drainage is the problem rather than erosion.

It is a member of the Grey-Brown Podzolic Great Soil Group and again the predominance of shale in the parent material causes an acidic reaction. This acidity, in addition to imperfect drainage, limits the growth of alfalfa. When cultivated, a seven inch dark greyish-brown clay loam is exposed over the mottled, less well defined horizons. Parent material is provided by a dark yellowish-brown clay.

Combined with the limitations imposed by acidity and imperfect drainage, Class II is inherently low in organic matter, phosphorous and calcium, and only moderately well supplied with potassium. The installation of tile drainage wherever possible, plus the application of the necessary soil nutrients permits the production of a wider range of crops and earlier spring cultivation.

Class III

I have grouped into this class, Fox sandy loam and Burford loam. The main limitations of these soils are provided by low fertility and droughtiness.

Both soils are the well drained members of their catenas and are classified under the Grey-Brown Podzolic Great Soil Group. Nearly level to gently undulating relief characterize the areas that this class occupies.

The Burford loam has developed on coarse, well sorted, gravelly materials such as those found on the terraces of the Acton Spillway. This coarse textured parent material is not found so extensively in the Georgetown Spillway simply because it has been subjected to more severe stream dissection. Consequently the existing deposits have been worked and reworked until materials forming the uppermost layers of the parent material have a definite sandy texture. As a result it is in the section covered by the Georgetown Spillway, and also on the Norval Sand Plain that Fox sandy loam has developed.

In the chapter on pleistocene geology it was mentioned that the deposits of the Georgetown Spillway were distributed in a discontinuous line. It is my belief that an isolated deposit of the sandy materials may be found around Concession II, Lot 10. This area has been similarly worked by stream action and closely resembles the deposits of the Georgetown Spillway, as delineated on Putnam and Chapman's map.

Class III has excellent internal drainage, consequently when combined with the low moisture holding capacity of this type, droughtiness results. This class also has an inherent low supply of plant nutrients being particularly low in organic matter, potassium and phosphate. This lack of organic matter in the surface horizons, droughtiness, and loose textured surface soils provide a soil grouping, particularly susceptible to wind erosion. In the cultivated sections of Burford loam, numerous cobbles appear on the surface and require frequent removal.

On the other hand, Class III is fairly well suited to the growth of cereal grains, hay and pasture. The nearly level relief, loamy texture of the surface horizons, freedom from large stones, and the possibility of early spring cultivation make this soil grouping somewhat desirable for cultivation.

The aforementioned characteristics are favourable for the production of certain high value cash crops such as tree fruits and small fruits, but the township is located

in a climatic belt that does not favour their growth.

The consideration of the close adjustment of man to this soil group in particular will be left to the chapter on present land use.

Class IV

Because of its singular characteristics, a single soil type, Dumfries loam, occupies this fourth class. It has developed on the coarse limestone and shale materials that were deposited by the melting ice and has not been modified to any extent by marine waters. The till is composed largely of Lockport dolomite, plucked from the edge of the escarpment and laid down in the form of till moraines. It is the well drained member of the catena and profiles exhibit the characteristics of the Grey-Brown Great Soil Group.

A typical soil profile shows six inches of dark grey-brown loam or sandy loam over well developed horizons. Stones are abundant and the parent material is a grey stony till.

Class IV presents distinct problems to the farmer. Relief is so steeply sloping as to make mechanized cultivation extremely hazardous. In addition, the occurrence of many large stones hamper easy cultivation. The fertility level is generally low to medium and the soil as a whole is generally susceptible to sheet erosion.

However, the loamy texture and porous nature of

the parent material permit early cultivation and as a result, much of the area has been cleared. Because of the overbalancing nature of the limiting factors, yields are poor in this section and much exists to-day as rough pasture.

Class V

In this classification I have grouped three soil types. Jeddo clay loam and Lyons loam are included as members of the Dark Grey Gleisolic Great Soil Group, while Bottomland is an intrazonal soil.

Jeddo clay loam and Lyons loam are the poorly drained members of the Onaida and Woburn catena respectively and consequently have the same parent material characteristics. Bottomland, on the other hand, has formed on alluvium and occupies the low-lying areas along stream courses which are subjected to flooding.

As might be anticipated, poor drainage is the main determinant for soils to be accepted into this classification. In all cases, surface relief is flat, or at the most, gently undulating.

Lyons loam develops in the depressional areas found in the sections of irregular relief of the Woburn soils, while Jeddo clay loam occupies the "flutes" of the Fluted Till Plain. It would be impossible to map their total distribution on such a small scale (see figure 6), but it may generally be said that they are found in most depressional areas in direct association with their well

drained catena members.

Agricultural utilization is almost entirely limited to pasturing. Much of Class V is under woodland but where it has been cleared, pasture predominates. In only very few sections is it economically feasible to install tile drainage.

Class VI

The land use capability in relation to agricultural practices is so limited in this last classification as to be almost non-existent. This soil type (Farmington loam) has developed on the sides of the Niagara Escarpment and on parts of the limestone plain of Esquesing Township. There is usually less than a foot of soil covering the bedrock and very little differentiation in colour or texture. The surface soil is usually a loam and a dark brown colour dominates the whole profile to the bedrock. Where soil materials have accumulated to a sufficient depth in isolated pockets, Woburn loam (Class I) has developed.

Crop production is almost entirely prohibited by the droughty conditions of the soil. Indeed, by far the greatest proportion of forest cover of Esquesing Township is found on Class VI land. Limited sections are utilized for grazing, particularly in the spring and after the fall rains when moisture is abundant. However, during the summer months, the soil becomes extremely droughty, even limiting forage activities.

From the foregoing treatment of soils, one can readily see the complexity of soils as they occur in Esquesing Township. Climate, physiography and even vegetation have all exerted their influence in providing the area under study with this myriad of complex, yet interesting soil distributions. A more complete description of individual profiles will be presented in the appendix, while the adjustment of man to this classification will be more extensively discussed in the following chapters.

CHAPTER II

HISTORICAL GEOGRAPHY

(A) INTRODUCTION

"An historical geography of any region is theoretically possible for every period of its history and is to be written separated for each period; there is not one but many historical geographies."¹

In the following chapter, four cross-sections of the geography of the past have been reconstructed. I have done this to satisfy two main objectives: the first and of primary importance is to provide a precise history of the township as interpreted by a geographer, compiled under one cover; the second is to allow the history of the present land use to be more clearly understood. As there is no written history of Esquesing Township in existence, only the main sources of reference will be noted. Much of the information came from unidentified newspaper clippings, interviews, and questionnaires.

(B) 1821

In 1821 the population of Esquesing Township was 478 and was almost entirely composed of immigrants from the British Isles, the majority being Scots.
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¹ Hartshorne R. The Nature of Geography. Annals of the Association of American Geographers, 1939. P.185.

The area under study was, at this time, one of the townships of Halton County which along with Wentworth County formed the Gore District. After 1812, the land around Esqueusing was purchased from the Six Nation Indians and in 1816, the Gore District was opened for settlement. The more accessible areas along the shores of Lake Ontario were naturally occupied first and it was not until 1818 that the first settlers began to move into Esqueusing Township.

Although the Gore District was set apart to be settled by the United Empire Loyalists, available reports and statistics indicate that the main body of settlers were from the British Isles. The last of the true United Empire Loyalists had been settled by 1797. The privations incurred in Britain as a result of the Napoleonic Wars, the abject misery fostered by the Industrial Revolution, and the inefficiency of the poorly administered laws provided ample incentive for the people to seek their fortunes in Upper Canada.

The tendency of these early settlers to locate rather "clannishly" has been well illustrated. One of the first sections to be settled was that which came to be known as the "Scotch Block". There is disagreement as to its exact location and extent but it is generally considered to be enclosed by the Nassagawaya-Esqueusing Township line and the Sixth Line, extending from the Base Line to the road joining Stewarttown to Speyside. As might be expected, the first settlers were Scots, many of them from the lowlands

of Scotland who brought with them that tenacity which was so essential in the early days of land clearance.

The English and the Irish were also represented and, although they freely settled among the Scots, there were two sections predominantly occupied by the Irish - Whaley Corners and Ballinafad. To-day Whaley Corners provides no urbanized function but in 1821, settlement was in progress which would be climaxed in later years. Early in the nineteenth century a wealthy American syndicate purchased a large tract of land at Whaley Corners intending to establish a colony and settle it with American citizens. For some reason, probably the reverses suffered in the war of 1812, the project was abandoned and the land sold to private citizens. The Irish also tended to settle around Ballinafad. The Shorthills, the most prominent Irish family of the early settlers, gave this name to the settlement deriving it from their native Ireland.

The first meeting in Esqueasing for municipal purposes was held at the home of J. Standish on Concession VI, Lot 13 on January 1st, 1821. Later, meetings were held in the tavern of T. Thompson on the Seventh Line, Lot 13.

As settlement progressed, one of the main essentials was a saw and grist mill. It is here that one must appreciate the influence that the drainage pattern has had on settlement as often a mill would form a nucleus around which an urban centre would develop. Arising in the swampy areas along the brow of the escarpment, the water

flow was usually reliable throughout the entire year. Again, since these streams were in a youthful stage geologically, their flow was rapid. From these two factors, the streams provided sufficient and reliable power for the water wheels of the early grist and saw mills.

Since the land had to be cleared before cultivation was possible, lumbering was the initial activity of the pioneer. Timber was the principal impediment to farming and as a result large sections were quickly cleared, the felled trees providing the basis for the potash industry. Because of the British market for potash, the need for a cash income, and the surplus of timber, each farmer usually reduced his woodland to ashes to be exported.

Timber also provided the principal source of building material. Although the first homes were constructed of logs, sawn boards were much in demand. As a result saw mills were the first to appear on the landscape. It was not until a later period that timber was commercially exploited and exported out of the township.

Stewartown (Stewarttown, Stewarton) is said to have been the location of the first settlers in the township and has been dated back to 1818. A tributary of the Credit River provided a source of power for the operation of a saw and a grist mill which had been built in 1820 by John and Duncan Stewart. Stewartown was named after these two men.

The year 1820 saw the establishment of the first post office in the home of Henry Fyfe (Seventh Line, Lot 9).

This post office was given the name "Esquesing" which it retained even after it was moved to Stewarttown in 1840.

In the year 1821, George Kennedy and his family were the sole occupants of "Hungry Hollow" (sixteen years later to be renamed Georgetown). At this time he is reported to have completed the construction of a small saw mill which received its motive power from the waters of Silver Creek.

Similarly, James McNabb had settled in the area which is now known as Norval. No mill was in existence by the year 1821 although one was under construction to be completed in 1823.

In addition to the privations imposed upon the settlers by the natural environment, the economic conditions of Upper Canada also posed problems. Settlers were primarily in a state of self-sufficiency, however, wheat was produced in sufficient quantities to provide a cash crop. The cultivation of wheat was encouraged by the privileges provided by the New Corn Laws of 1815. By this act, North American colonies were given an advantage over foreign competitors for the wheat market in Britain. Also, rising prices, stemming from poor harvests in Europe during the years 1816 to 1820, encouraged an increasing emphasis to be placed on the cultivation of this crop.¹

Even Esquesing Township, with its limited

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¹ Jones R.L. History of Agriculture in Ontario 1613-1880 University of Toronto Press, Toronto 1946.

cultivated acreage tended to rely on wheat as its main cash crop. However, in 1820, there was an abundant harvest in Britain and wheat and flour from Upper Canada were declining in British estimation due to improper handling. Consequently, in 1821, wheat dropped to one-half its previous price.

In conclusion, the year 1821 saw settlement in Esquesing Township consisting of a few isolated clearings occupied by a self-sufficient farm. A few milk cows foraged in the bush while the settler cultivated his land between the protruding stumps with a team of oxen. Cross-road settlements were practically non-existent simply because roads were few and far between. Transportation of any surplus agricultural produce was usually carried out during the winter when the trails were sufficiently covered with snow to support a sledge pulled by plodding oxen.

As a result, economic depression combined with apparent insurmountable obstacles presented by the physical environment provides a study of truly pioneer conditions.

(C) 1851

Because of the radical change in the cultural landscape, the next geography to be studied is that presented by the year 1851.

In this year, the population of Esquesing Township numbered 5,225. Two thousand of these claimed the British

LAND USE TRENDS 1826-1951

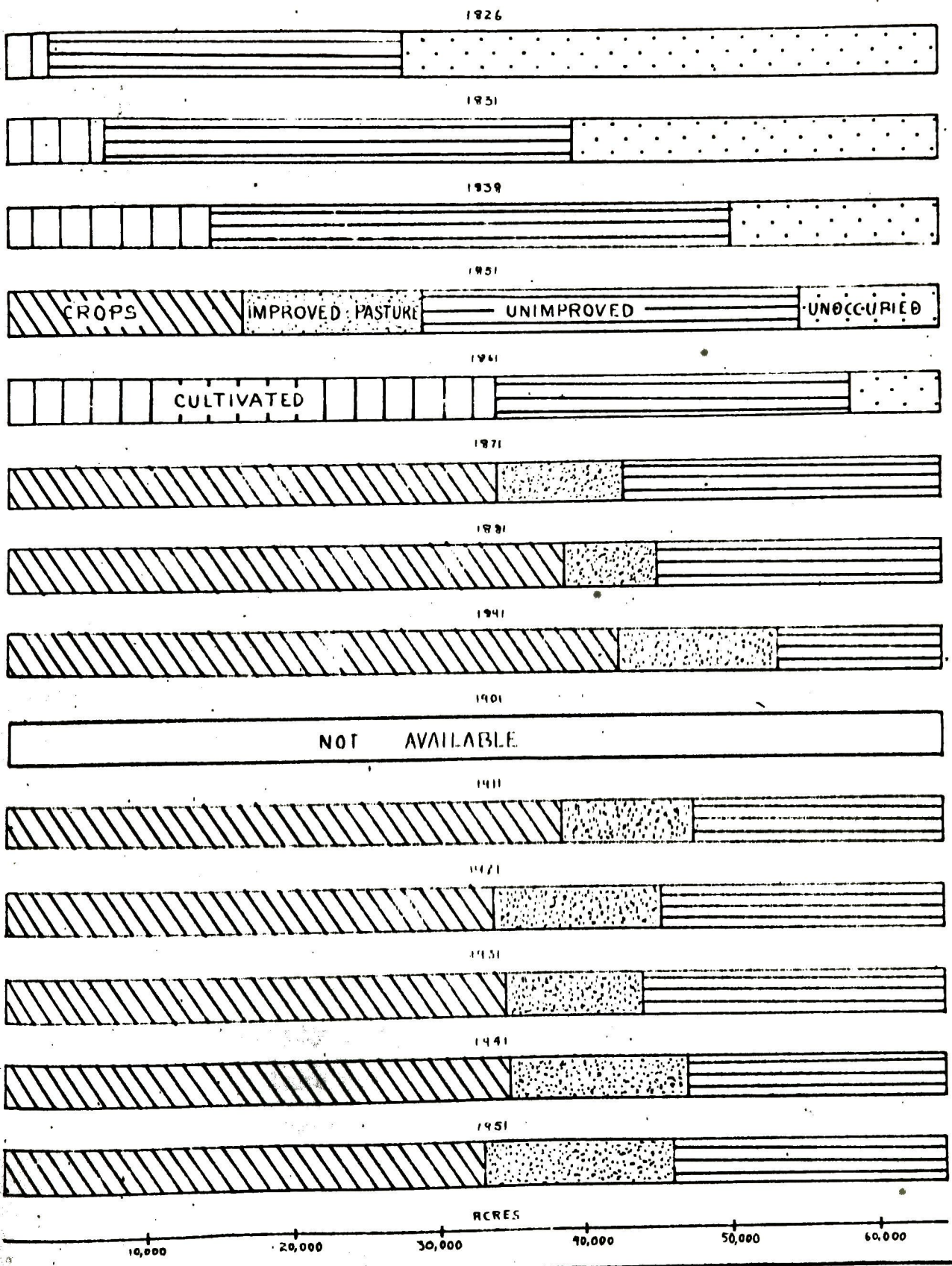


FIGURE 7

Isles as their place of birth while 3,025 purported to be Canadians (mainly second generation British immigrants). Only 200 came from the United States.

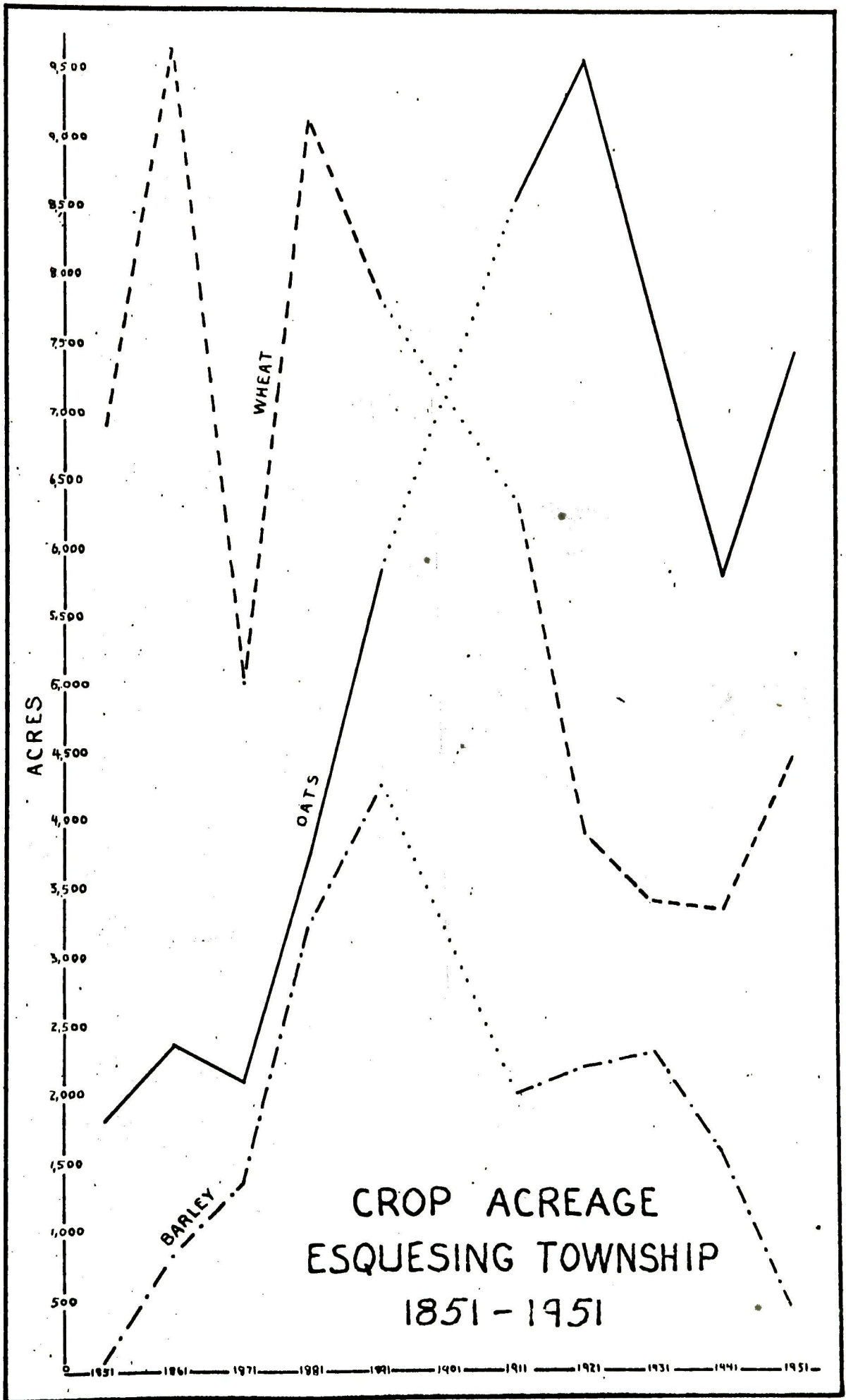
The year 1851 saw 54,461 acres occupied, with roughly one half of this being cultivated (see figure 7). The previous three decades had seen an increased emphasis on the production of wheat. Indeed, by 1851, wheat occupied by far the greatest acreage under cultivation (see figure 8).

Between 1825 and 1831, wheat gradually became the most important cash crop. A tariff was imposed upon American goods and an increased local market was provided by the great influx of British immigrants. Consequently by 1831, the farmers felt that their future was economically secure with the continued production of wheat.

Crop failures in Canada, abundant British harvests, and European depressions all but eliminated wheat export during the 1830's. It was not until 1840 that this crop was again exported in any quantity to the British Isles. Good harvests, an increased acreage under cultivation, and changes in the Corn Laws had once again provided the necessary supply and demand for those so dependent upon a single cash crop. Even after the policy of free trade was adopted by the British in 1846, wheat continued to be of prime importance. Now, wheat was simply purchased by American speculators, transported to a lake port (Oakville), shipped across Lake Ontario and down the Erie canal on its way to Britain.¹

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¹ Ibid. Chapter XI.



CROP ACREAGE
ESQUESING TOWNSHIP
1851 - 1951

FIGURE - 8.

The other crops such as peas, oats, maize and barley were primarily intended to be consumed on the farm. In addition to providing excellent food for the livestock, the export of these crops was limited by their bulky nature and low market value.

It is of interest to note that oats occupied the second largest acreage of cropland in 1851. This may partially be a direct result of the large percentage of Scots who settled within the township as it provided the main staple of their diet. In addition, the increase in the number of horses (1,169 in 1851) increased the need for the cultivation of oats.

As of 1851, the pea weevil had not seriously affected the pea crop of Esquesing Township. In this year, 1,462 acres were under cultivation from which 20,384 bushels were harvested and utilized mainly for the fattening of the 2,201 hogs.

Livestock was generally poorly bred before 1851. The early settlers simply allowed their animals to forage in the bushland that enclosed the settlements, a practice that resulted in the development of a wiry, half-wild beast. This was particularly true of the hogs which roamed the forest at will providing the historian with anecdotes of their ferocity. However by 1851, an increased interest in livestock raising was beginning to appear. Indeed, from the census of 1851, about one half of the cultivated land was under improved pasture. (see figure 7)

Climate and available markets were the main factors affecting this type of agricultural economy. The frost free season was not entirely adequate for the successful cultivation of Indian maize and, as a result, the "corn-hog" economy that prevailed in some sections of the United States did not develop. On the other hand, the production of both spring and winter wheat seldom suffered from climatic limitations. The winter snows covered the grasses on which livestock could feed and therefore it was not until 1871 when hay production increased that livestock became important agriculturally.

Markets also encouraged the cultivation of wheat. Increased immigration provided a larger local market while population became more dense as northward expansion was limited by the Canadian Shield. The European market was opened by the improved transportation facilities of 1851. A plank road had been constructed from Stewartown to Oakville which was extensively utilized in the transport of grain and timber. From Oakville it went by ship down the St. Lawrence River, but in 1861 much was transported via the Erie Canal.

The year 1851 ushered in an era of improved transportation facilities - a factor which would greatly affect the cultural landscape. In the years preceding 1851 there were only two main roads open throughout the entire year. It is true that most of the concession and line roads were surveyed and laid out by this time but they

were most efficiently utilized only in the winter. The York Road, extending from Little York to Guelph, was opened as far as Georgetown in 1832, passing in a diagonal line through the township (later Highway No. 7, constructed in 1923). This road was later planked, providing comparatively good communications from Georgetown and Norval through Brampton to Toronto.

The Seventh Line was built in the early days primarily as a colonization road. It was surveyed in 1837 and was called Harkin's Road after the surveyor. Later it was given the name Garafraxa Road and extended from Oakville to Owen Sound primarily to open up the latter area. It was of importance to the farmers of Esqueping Township as it provided a routeway over which grain could be transported to the shipping port of Oakville. Before the Grand Trunk Railway was completed, wheat from as far north as Erin (Erin Township, Wellington County) was teamed down the Seventh Line to Oakville Harbour.

Because this road was so intensively used by the inhabitants of the area under study, the Trafalgar Road Company decided to capitalize on this routeway. During the early 1850's this road was planked and made into a toll road. A combination of intensive use and neglected repairs wore out the road within seven years.

Railway construction was also becoming an essential feature of the cultural landscape. Although not completed until 1856, the Grand Trunk Railway had been under construction

since 1846, cutting diagonally across Esquesing Township joining Guelph, Acton, Georgetown, Brampton and Toronto.

In 1851 the population of Georgetown was 700. There were two tanneries, one grist mill, one saw mill, one cloth factory, one ushery, two cabinet shops, three wagon factories, five blacksmiths, two tailors, two shoemakers, one tavern and two general stores. By this, one clearly sees the predominance of industries dependent upon a local source of raw materials.

Historically, industry of primary importance began in 1837 when the Barber Brothers built their woolen factory. In 1851, 40 hands were employed. At this time the settlement was still known as "Hungry Hollow" but was soon changed on the recommendation of the Barbers to Georgetown in honour of George Kennedy, the first settler. The woolen factory processed the wool received from the surrounding area (6,751 sheep in Esquesing in 1851) and utilized power supplied by the Credit River for the manufacture of woolen articles.

Similarly the tanneries processed the hides received from the surrounding area. In turn the Dayfoot Boot and Shoe Company who employed 30 hands made use of the processed leather.

The blacksmiths catered to the local trade, but the shop operated by J. Dolson grew to the proportion of being considered a foundry. Here he manufactured machinery castings for the local farmers.

The cabinet shops and wagon factories all made use of the abundant supply of timber that still existed. It is in 1851 that the last mention is made of the existence of an ashery. As previously mentioned, the manufacture of potash provided a substantial initial source of income because of the European demand for potassium salts to be used in soap, fertilizers, and other such manufactures. The reason for the disappearance of this industry may be seen by the rapidity with which the land of Esquesing Township was being cleared. After 1851, the existing supplies of available timber to be reduced to potash were becoming limited.

The commercial importance of Georgetown was certainly overshadowed by industry. Only two general stores, two tailors and one tavern previously mentioned provided the commercial function of this settlement. Although there is some doubt as to the exact number of stores, the most generous writer of the 1850's¹ attributed no more than three to Georgetown. In any event it must be realized that they served essentially only the inhabitants of Georgetown. In 1851, travel was not facilitated by excellent roads and motor vehicles as it is to-day and therefore many small embryonic urban centres existed serving only their own inhabitants and an immediate hinterland.

The growing importance of Acton was also evident at this early date. By 1851 population has been estimated

¹ Mackay R. W. 1851 Canada Directory.

at approximately 425 most of whom were employed in the two tanneries, two saw mills, two wagon factories, and the three shoe factories. There were also three general stores, two inns and several smithies. The reasons for their occurrence in 1851 are similar to those of Georgetown and require little mention here.

Nine years after George Kennedy settled in "Hungry Hollow", Acton was simply 400 acres of farmland owned by Zenas, Rufus and Ezra Adams on Concessions II and III. As in the case of most of the small urban settlements, Acton owed its origin and subsequent growth to the establishment of a grist and saw mill. A creek had been dammed to provide a constant head of water to supply the motive power for these mills. The pond that was formed is now known as Fairy Lake.

When the first store was established the name of this settlement was accepted as Danville only to be later changed to Adamsville in honour of the first settlers. In 1844 the present name of Acton was given to this settlement by Robert Swan, the first postmaster.

In 1837 the first tannery was established, owned and operated by Abraham Nellis. This was the beginning of an industry which now dominates and has so effectively controlled the growth of Acton, - that of the present day Beardmore and Company Limited.

The village of Norval was also a flourishing centre in 1851. It contained the usual supply of industries;

one grist and oatmeal mill, one saw mill, one tannery, two smithies, three shoemakers, one tavern and two general stores. Population figures are lacking for this date but an approximation of 225 may be made.

The grist mill built in 1828 by James McNabb was for a time said to be the largest in Canada. It was a brick building three stories high, one hundred feet long and thirty-five feet wide. It had eight run of stones and a capacity of two hundred barrels of flour a day. This mill, as might be expected, was of great importance to the infant community, attracting farmers from both Chinguacousy and Esquesing Townships.

Both the physical and cultural environment affected the establishment of this mill. At Norval the Credit River is confined between the narrow walls of the till plain. During post-glacial times, the swift flowing river rapidly eroded the till plain providing a narrow, steep sided, V-shaped valley. The walls of the valley were sufficiently close together to facilitate the construction of a dam. In addition the presence of the well travelled York Road provided an excellent means of transporting grain to and flour from Norval.

In 1830, McNabb had the site surveyed into village lots and through his encouragement both settlers and industry were attracted. Until 1840, the village site was known variously as McNabb's Mill, McNabbville or simply McNabb, but then a post office was opened and the name fixed as

Norval. It is of interest to note the influence that surrounding physiography had even in deciding the name of this village. Colonel Clay, the first postmaster compared the hills surrounding this little settlement to the Grampian Hills where the hero "Norval", of John Hawe's poem "Douglas" lived.

Glen Williams in 1851 is so similar to Norval in physical site and urban development that it only requires slight mention. In the same manner the Credit River had cut into the existing pleistocene deposits to provide an excellent dam site. The original settler in 1824 was Charles Williams and it was his son Jacob who took advantage of the narrow valley walls and the swift flowing river to provide the motive power for these early industries. By 1851 a grist mill, a saw mill and one woollen factory were in operation.

In Stewartown, in addition to the mills mentioned in 1851, there were two general stores, a saddlery, a tannery, and a cabinet shop. After 1849, the municipal meetings of Esqueving Township were held in Mackenzie's Tavern in Stewartown. Since then, this village has been the administrative centre of the township and the seat of the local governing body. At this time, the population of the village is estimated at 300.

In 1851 it is significant to note the appearance of the steam engine as a source of industrial motive power. During the previous forty years, industry had been forced

to locate adjacent to the only source of power - flowing water. By the year 1851 industry was allowed freedom of location as steam engines were generally being accepted as an alternative source of power. It is now that transportation facilities become of primary importance in controlling industrial location.

In summary, the year 1851 saw much of the pioneer rawness that existed in 1841 removed. A larger acreage was under cultivation and the oxen were giving way to the horses as draft animals. The farmers were engaged in an exhaustive system of agriculture concentrating on one main crop - wheat. Since the market for wheat was unpredictable and uncontrolled by the local farmers, the prosperity of the inhabitants was particularly variable. In addition to American tariffs against Canadian agricultural products, the vacillating nature of the British Corn Laws made the cultivation of wheat one of speculation. In 1851, abundant harvests and a favourable repeal of the Corn Laws provided prosperity to the inhabitants of Esquesing Township.

(D) 1871

In 1871 the total rural population of Esquesing Township numbered 6,139. By 1861 it had reached 6,076 and for the next ten years it remained comparatively stationary.

The decade immediately following 1851 saw the rise in rural population resulting from several related features.

In 1854 the Reciprocity Treaty was signed with the United States allowing the comparatively free flow of goods between the two North American countries. The prosperity that resulted from such an agreement was followed by an influx of settlers. Immigrants in transit to the United States were attracted by the economic opportunities offered and many decided to remain. At the same time, losses of native Canadians by emigration to the United States were relatively light.¹

However this influx of settlers declined in the decade previous to 1871. The termination of the Reciprocity Treaty and the erection of American tariff barriers against Canadian exports made the early years of the 1861 - 1871 decade one of economic stress and readjustment. Any immigration was counteracted by emigration of Canadians to the United States and the Canadian West.

By the year 1871 all of the land of Esquesing Township had been occupied. Robinson² states that the township was fully occupied by 1848^{year} however statistics (see figure 7) indicate that the 1871 was a more likely one.

The two decades that had passed since 1851 had seen the construction and completion of the Guelph-Toronto line of the Grand Trunk Railway through Esquesing Township.

¹ Hurd, W. B. Contemporary Demographic Movements Underlying Canadian Agricultural Development. Advisory Committee on Reconstruction. McMaster University. 1943.

² Robinson, C. Ontario Agricultural Commission. Appendix B. Volume II. 1881.

Started in 1846, it was completed in 1856 and was opened for traffic in September of that year. During the construction of this railway, large sums of money poured into the township from the purchasing of rights of way, the hiring of teams and labourers and the increased local market that was created by imported labourers.

Although there was a very general and gradual movement towards the diversification of agriculture, wheat maintained its position as the most important single crop. The year 1871 saw a very serious decline in the cultivation of this crop. Since another boom period, similar to that caused by the Crimean War was expected to result from the American Civil War, many acres of this speculative crop went under cultivation. However the demand for wheat was not as was expected due to the increased competition from the American West. By 1871 this fact was evident to the agriculturalists of Esqueewing Township and the production of wheat declined.

The year 1871 is marked by a gradual increase in the production of barley. This may be explained by the fact that Canadian barley was in great demand in the United States since the termination of the Reciprocity Treaty did not affect the trade of this commodity. The increased demand provided by the American market was a direct result of the large influx of Germans and other Europeans who consumed large quantities of beer. Since there was a severe tax on whiskey during the Civil War

beer provided a cheaper alcoholic beverage.¹

Also connected with the brewing industry was the cultivation of hops. It is from the cultivation of this plant that one finds the close relationship of man to his physical as well as economical environment. According to Klages², "being a deep-rooted plant, the hop requires a deep well-drained soil. Alluvial soils, or deep sandy or gravelly loam soils are most desirable. Heavy clay soils, especially if wet, must be avoided." In addition, the maintenance of the hop yards requires much labour. Consequently to satisfy both soil and labour requirements, the hop yards had to be situated on sandy soils near a fairly large centre of population. The village of Georgetown adequately fulfilled these requirements.

In 1851 only 25 pounds of hops were produced but this rose to 2,029 pounds in 1861. By 1871, 200 acres were under cultivation, the yards varying from 4 to 15 acres in size and all occurring in or near the village of Georgetown.³

All of the hops, and a large percentage of the barley produced, were sold to Brain's Brewery (established in 1845 on the Eighth Line, one mile east of Hornly). By

¹ Op. Cit. Jones H.L. Chapter VIII.

² Klages K. H. W. Ecological Crop Geography. The Macmillan Company. New York. 1961.

³ Pope J. H. Atlas of Halton County, Ontario. Walker and Miles. Toronto 1877.

AGRICULTURAL TRENDS 1851-1951

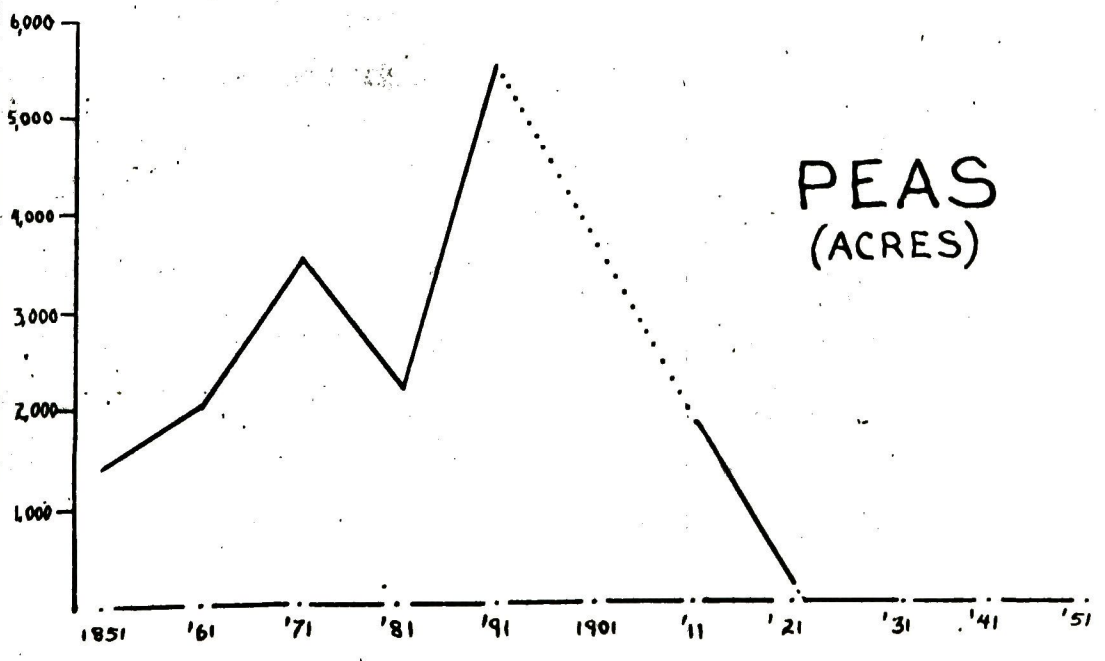
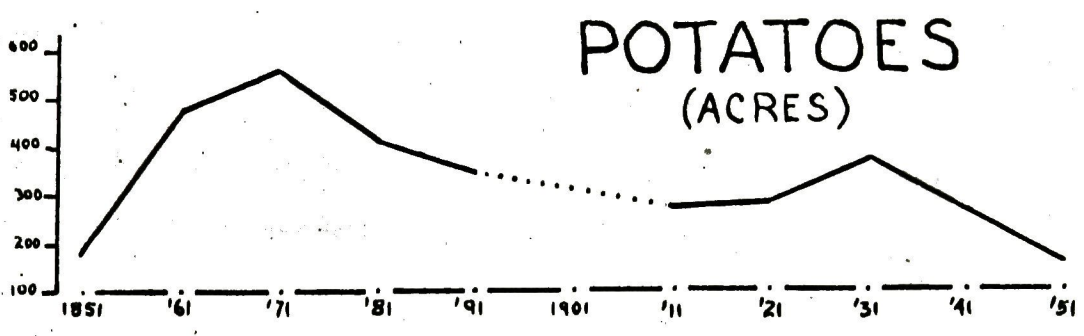
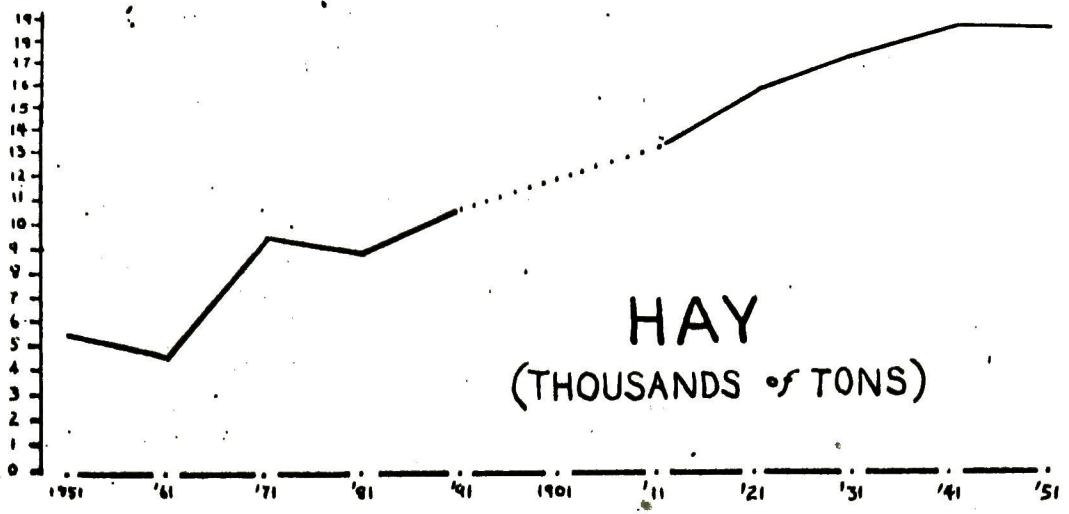


FIGURE 9.

1877 this brewery employed 10 men who utilized 10,000 bushels of barley and 8,000 pounds of hops in producing 4,000 to 5,000 barrels of beer annually.

Pea production increased from 20,384 acres in 1851 to 60,710 acres in 1871 and was closely controlled by the increased demand of Britain and the United States. Esquesing Township was relatively unaffected by the pea weevil which ravaged so much of Ontario's pea crop in the 1860's and 1870's. It was not until a later date that this insect effected a decline in pea production.

The increased acreage of oats and hay is closely related to the growth of the livestock population. In addition, during the period of reciprocity, large quantities of oats were exported to the United States. However, with the abrogation of this treaty and the subsequent loss of an export market, production of oats was below normal in 1871.

By this year, Halton County was included in the chief cattle raising region in Ontario. The dairying industry which now accounts for so much of the farm income was in an embryonic state and will be considered later.

The facilities offered by the Grand Trunk Railway tended to concentrate the rising population in a few urban centres. However, the effects of this railway on population are only relative, that is, it provided the incentive for the increased growth of Acton and Georgetown but did not immediately effect a decline in the rural villages which were well established (viz. Norval and Glen Williams).

Actually the only reason for the increased predominance of these two urban centres over the others was that new industries were attracted to them because of the railway. The old, well established industries of the rural villages could still efficiently compete with those of Georgetown and Acton. The smallest centres such as Speyside, Ballinacfad and Peru which had no strong industrial development could not, however, hope to provide any competition.

Physiography controlled the construction of the railway through Georgetown rather than Stewartown or Glen Williams. At Limehouse there occurs the only significant "break" in the Niagara Escarpment for several miles. Without this gap, the railway would have been constructed in a straight line to join Acton to Brampton running through Glen Williams. However since the difficulty of excessive cutting could be overcome by utilizing this gap, the railway ^{was} directed southwards so that it ran through Limehouse and Georgetown and then on to Brampton.

Georgetown in 1871 was supported by a population of 1,282. Although it had always been the leading urban centre in Esquesing Township it now forged ahead of the other aspiring settlements by leaps and bounds. Georgetown remained part of Esquesing Township until December 13th, 1884, when it was incorporated as a village.

The woollen mill of the Barber Brothers was removed in 1853 but the presence of the Grand Trunk Railway prompted them to build a paper mill. This mill provided the basis of

one of Georgetown's leading industries to-day. Even in 1871, a high grade quality paper was manufactured from wood and straw pulp, developing the highly skilled labour which made possible the present day Alliance and Provincial Paper Companies. By 1871, water and steam appear to have been of equal importance in providing motive power for industry, for in the Barber Paper Factory, there were four water wheels and four steam engines. As a complementary industry, K. C. White utilized some of this high grade paper in the Georgetown Envelope Factory.

The many smithies that catered to the local trade of 1851 were still present and the foundry of J. Dolson provided the basis for the new Franz and Pope Knitting Machine Manufacturing Company. J. B. Dayfoot still operated his boot and shoe factory. It had expanded to employ 80 to 100 men and manufactured principally heavy boots which were marketed in Toronto. The industries dependent upon a constant supply of wood were still in evidence.

The commercial function of Georgetown had greatly increased since 1851. By 1871 there were two hardware stores, one drug store, one jewelry store, two bakeries, and several general and grocery stores. In addition, Georgetown boasted of four doctors and three lawyers.

The rise in the commercial importance of Georgetown may be directly related to the improved roads and increased number of carriages. Also, being situated on the main line of the Grand Trunk Railway, it was a simple task to ship

manufactured goods from the larger industrial centres to Georgetown for distribution.

Acton was also benefiting from the facilities provided by the Grand Trunk Railway. Although it was not to be incorporated as a village for another two years, by 1871 it supported a population of 900.

The tannery operated by A. Nellis in 1851 was now owned and operated by the Beardmore Leather Company. The hides processed by this firm were principally imported from South America. The combination of a pre-existing tannery, a local supply of employees skilled in the tanning industry, and the excellent transportation facilities attracted the established Beardmore firm in 1865. From that year to this, the prosperity of Acton may largely be related to the policies of the Beardmore Leather Company.

By 1875, 10,800 sides of leather were processed each week by the 350 employees who utilized 1,800 to 2,000 cords of bark in the tanning process. Most of the hides were made into shoe leather which was marketed from coast to coast. Both the imported raw materials (cork from the Mediterranean and hides from South America) and the exported finished product were extremely dependent upon the facilities provided by the railway - indeed a spur line was even built into the yards of the tannery. This tannery has been, and is to-day, the largest single industry of Acton.

Another industry whose establishment may be directly related to the construction of the Grand Trunk Railway was

the plant of W. H. Storey, Canada Glove Works. As the market was entirely wholesale (Winnipeg to Halifax) railway transportation was essential. Indeed, the presence of the Beardmore Leather Company may have also been a significant factor in location since the Canada Glove Works utilized the leather produced by this tannery. However, in 1875, W. H. Storey found it more satisfactory to erect a tannery of his own.

A similar proportion of smithies, bakeries, hardware and grocery stores that occurred in Georgetown was found in Acton.

For thirty years after the Grand Trunk Railway was built, all trains were hauled by wood-burning engines. Acton was the largest source of fuel (beech and maple) between Toronto and Stratford. The geographical position of Acton may be directly related to the marketing of this fuel as much of the material was carted in from the forested sections of Nassagaweya and Erin Townships. Acton benefited from this fleeting market until the innovation of the coal-burning locomotive.

Acton also benefited from the fact that the village of Milton was not served by a railway line. Acton provided one of the main stations used by this municipality for the movement of both people and marketable goods.

It is in the year 1871 that the lime industry of Equeusing Township becomes of economic significance. Much of the dolomite, mainly of the Lockport formation, is well



Photo No. 11. Pot kilns found in the vicinity of Limehouse. Until 1932 they were operated by the Toronto Lime Company Limited.



Photo No. 12. Draw kilns at Dolly Varden. Note how the quarry floor is level with the top of the kiln.

exposed along the top and in the face of the Niagara Escarpment. It is of a good grade of purity, yielding a grey lime which was utilized to a considerable extent in the construction industry.

At the bottom of the formation, the masses of shaley and ferruginous dolomite (waterlime) had been used for many years by a single industry in Limehouse for the making of natural cement. However this type of dolomite was useless in the manufacture of lime and had to be discarded.

Although the lime producing industries did not actually operate to any great extent commercially until 1873, the lime kilns at Dolly Varden (Concession IV, Lot 23) and at Limehouse were under construction. Again the Grand Trunk Railway had its affect in deciding the location of the industry. Because of the bulky nature of the goods produced, an economical means of transportation was required. In addition, an accessible supply of dolomitic limestone was needed. As a result of these two needs, the location of the main lime kilns occurred where the transportation facilities (Grand Trunk Railway) came in contact with the supply of raw materials (Niagara Escarpment). It is true that Esquesing Township was crossed diagonally by a series of lime kilns whose locations were entirely controlled only by the Niagara Escarpment but these were, for the most part, operated by the local farmers and attained little commercial significance.

Fountain Green, whose name was later changed to Limehouse with the establishment of a post office in 1857,

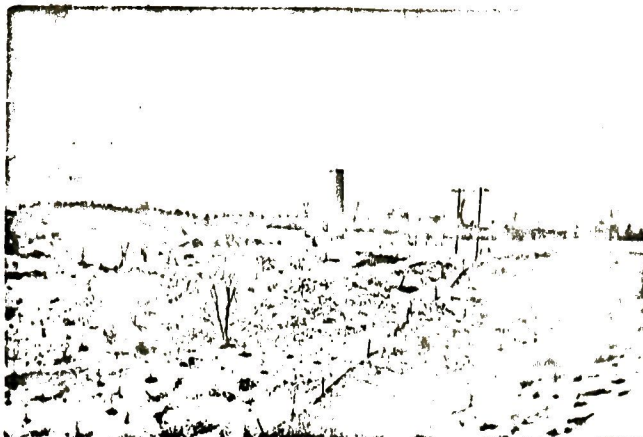


Photo No. 13. Abandoned plant of the Halton Brick Company near Terra Cotta. This plant ceased operation in 1934, and has recently been sold with the prospect of future expansion.



Photo No. 14. Factory of the Empire Blanket Mills established in 1868 by J. Newton. Note how the plant was built "straddling" the source of motive power.

had several industries other than the lime kilns. John Newton established the Empire Blanket Mills in 1863 and manufactured flannels, sheetings, tweeds, and yarns to supply the local demand. Woollen blankets were also produced but were exclusively for the wholesale trade. John Newton and Sons manufactured mineral paints for outbuildings and fences. The market for this product was mainly wholesale and extended even as far as Australia. Both mills received their motive power from a combination of water and steam. Also in operation in Limehouse in 1871 were two saw mills and one free stone quarry.

Glen Williams in 1871 was supported by 500 inhabitants, most of whom were employed in the various industries which derived their motive power from the excellent dam sites found in the vicinity of this village. Indeed it seems that the perspicacity and acumen of the Williams family combined with this excellent source of power formed the basis of a prosperous industrial economy. As of 1871 it appears that the construction of the Grand Trunk Railway through Georgetown had not seriously affected Glen Williams.

The woollen mill erected in 1839 by J. Williams was now operated by Benajah Williams who employed 50 or 60 hands in the manufacture of yarns and knitted goods of every description. This industry received its total power supply from a forty horse power Laffel water wheel.

Similarly the Glen Williams Flour Mill (owned and operated by J. Williams) was driven by water which

operated three run of stones. Charles Williams maintained the reputation of the Williams family by operating a saw mill and lath factory. In addition there were the usual smithies, grist mill, post office and general store.

Norval in 1871 was also unaffected by the building of the Grand Trunk Railway and was inhabited by a population of 450. McNabb's Mill was now owned by R. Noble who purchased it in 1868. Again the prosperity of this rural village may be directly related to a combination of the driving forces provided by a personality and the waters of the Credit River. Noble maintained this mill at its high state of productivity and in addition he added a cooperage to manufacture barrels in which the flour was shipped. He also established a saw mill to provide staves for these barrels. The Norval Woollen and Cotton Bating Mills was another industry opened by R. Noble. All of these mills were powered by the Credit River. The usual assortment of smithies, general stores, taverns, tanneries and boot and harness shops were also in evidence.

Stewartown in 1871 had been affected by the construction of the Grand Trunk Railway through Georgetown. By this year, the population had decreased to 200. The reason for this can only be explained by its proximity to Georgetown combined with the absence of a strong industrial economy. A steam saw mill and flour mill were owned and operated by the Lawson Brothers and plans were being made to enlarge the former to include a shingle mill. Again, the

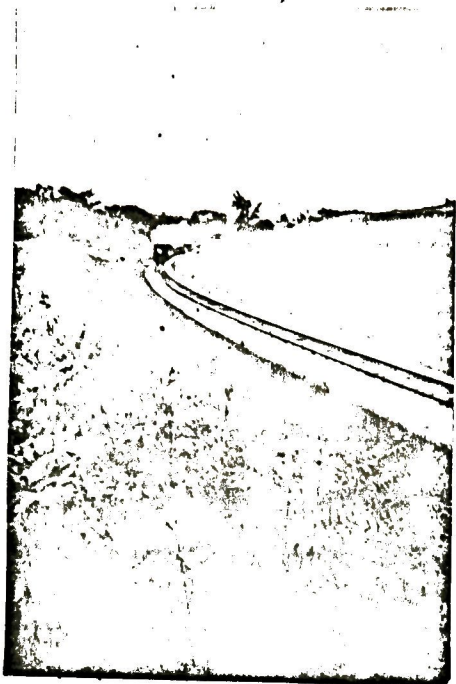


Photo No. 15.
Toronto-Stratford
line of the Canadian
National Railways at
the "break" in the
Niagara Escarpment.

Photo No. 16. Upper
face of the Niagara
Escarpment illustrating
dolomite cap-rock.



usual establishments such as saddlers, smithies, tanneries, churches and a post office were present.

Hornby in 1871 is unique in that it is said to have had over 150 inhabitants, but no industries. There were however, four churches, one hotel, two temperance houses, one school, a post office, one general store, an Orange Hall and a drill shed. The population figure given is, I believe, a gross overestimation. Possibly no more than thirty people would be employed by the previously mentioned establishments while Brain's Brewery which was located one mile to the north-east only employed a maximum of 10 men. It must be remembered however, that there were no well defined municipal boundaries to this village and that the adjacent agricultural population of Esquesing and Trafalgar Townships probably would have been included. Consequently the statement that this village contained over 150 inhabitants is a misrepresentation of the number of inhabitants that the establishments of this village supported.

A population of 150 is also attributed to Ballinafad. Certainly there is more reason to give such a figure to this village as it had a pump factory and carriage works in addition to one hotel, two general stores, a post office and a smithy. Many of these inhabitants ^{may} have been agriculturalists living close to the surveyed boundaries.

Ashgrove, Speyside and Peru are relatively insignificant in 1871. The absence of the Credit River, efficient business minded individuals and rail transportation

caused the decline of these settlements. Although they had never been as well developed as other centres within the township, they were now entirely overshadowed by these other villages.

References to the settlement of Silver Creek occur only between the years 1851 and 1900. This hamlet must have been subjected to a rapid rise and fall in importance as no mention can be found of it after 1900. In 1871 it was a small "village" on the Seventh Line near Lot 25 and was supported only by a small quarry. Since it supplied the stone for the International Bridge at Buffalo it is possible that after this structure was completed and the market was terminated, this settlement declined. Although it supported, at one time, a fairly well established grist mill, even this was absent in 1871.

J. H. Pope states that the building of the Grand Trunk Railway immediately caused the decline of by-passed rural villages. However this is only partially true. In 1871 there were three types of urban centres. Georgetown and Acton were by far the largest centres resulting from the existence of a well established labour supply and industrial establishments, transportation facilities and steam power. Norval and Glen Williams were expanding but not nearly as rapidly, receiving their impetus from capable business men and an adequate supply of water power. The third type is composed of such settlements as Speyside, Peru, Ashgrove etc. which were rapidly declining due to their inability to

attract industry and the proximity of larger centres which could capably control the commercial function of these small rural villages.

In summary, the inhabitants of Esquesing Township generally enjoyed prosperity both in urban and non-urban activities. Halton County was separated from Wentworth County in 1853 and by 1871 consisted of the four townships of Nassagaweya, Esquesing, Trafalgar and Nelson. In this way, the old Gore District disappeared from the records.

Rural population had remained constant for over a decade but now the westward migration had begun. Since inefficient farming practices did not bring substantial financial returns, many lost their farms as mortgages were foreclosed. On the other hand many succumbed to the advertisements of the railway or prairie land companies, or many simply sold out while real estate value was high and migrated to the cheaper western lands. The attraction of the rapidly growing cities of Canada and the United States also had its influence in effecting rural depopulation.

(E) 1911

The most significant feature of the geography of 1911 is the absolute decline in rural population. As this phenomenon is a result of several interrelating factors, a full interpretation of rural depopulation will be omitted until the end of this section.

One cannot help but notice the change which had taken over the agricultural economy of Esquesing Township. Wheat production was steadily decreasing as was barley, potatoes and peas, while the acreage under oats and hay increased. By 1911 the area under study was recognized as one dependent upon mixedfarming with emphasis on dairying. No longer was Esquesing Township strongly liable to the uncontrollable fluctuations of the wheat market and harvests but rather "became dependent on the general rather than the special crop situation"¹. The tariffs imposed by the United States, the competition from the Canadian West, and the rise in urban population all account, in part, for this change.

The Canadian West, by 1911, was producing large quantities of wheat. The physical environment was well suited to the cultivation of this crop and the railways provided excellent facilities for transportation to eastern markets. This new source provided a serious threat to the economical production of wheat, particularly spring wheat, in Esquesing Township. Although the farmers were keeping abreast of farm mechanization, their land was becoming too valuable for the production of this crop owing to the proximity of growing urban centres.

As the cultivation of barley was largely controlled by the American market, the erection of protective tariff barriers by the United States had resulted in a decreased

¹ Roads L. G. Agricultural Geography of Southern Ontario. PH.D. Thesis, first draft.

acreage. Both pea and potato crops had also declined in importance. The former from the ravages of the pea weevil and the latter from competition from better suited areas.

The rise in urban population provided a market for the dairying industry which was now beginning to dominate agricultural activity. Improved transportation facilities, the advent of pasturization and the introduction of modern milk distribution were in effect by this year.¹ Consequently both hay and oat production increased by this year as did corn for ensilage (1871,309 bushels were produced, while in 1911, the number of bushels numbered 9,378).

In addition to the proximity of urban markets, the soils of Esqueving Township capably support the dairy industry. The gleisolic soils are particularly suited as their utility is economically limited to pasture. The large area of Class I land allows the unimpeded cultivation of mixed grains and forage crops while Class IV and portions of Class VI land may best be utilized for rough pasture.

This year saw the pre-eminence of the two urban centres of Georgetown and Acton over the now declining rural villages. By 1911 the competition provided by these two centres resulting from improved transportation facilities and changing means of industrial motive power overcame the industries of the smaller centres. In this "pre-transport truck" era, the railways were all important for it was by rail that raw materials and manufactured goods were imported

¹ Ibid. Reeds L. G.

and exported. Coal also had to be transported to provide fuel for the steam engines which supplied power for local industry. Since the cost of power would have been greatly increased by carting this coal from the railway to outside centres such as Norval or Stewarttown, industries naturally tended to locate in Acton and Georgetown.

Also the importance of hydro-electric power was realized by 1911. Indeed, as early as 1881 a local source was in operation. In this year the Barber Brothers established the first electric transmission line in Canada, some reports say in North America. They dammed the Credit River on Lot 17 and built a power house from which the transmission lines led to their paper mill.

In 1911, the population of Georgetown was 1,583. Since 1871, another railway had been built through Georgetown joining Hamilton to Allendale. This line was constructed by the Hamilton and Northwestern Railway in 1873 but was sold in 1892 to the Grand Trunk Railway.

The main industry was the Georgetown Paper Mills. This firm was operated by the Barber Brothers and by 1911 was made up of four separate buildings covering one and three quarter acres of floorspace. For many years after this industry went into operation, paper was made exclusively from cotton and linen rags, then for a decade or so, oat, wheat, and rye straw was processed to make paper. By 1911 wood pulp was almost exclusively used. The principal product was machine finished book paper, lithographic and label

papers and the better grade of newspaper. The daily output was approximately five tons, all of which was marketed from coast to coast.

In 1910, the Georgetown Coated Paper Mills, Limited was formed. Local residents under the leadership of L. E. Fleck decided that they would also utilize the transportation facilities provided by the railway, and the existing labour supply already skilled in the art of paper making. The original building was erected during the latter half of 1910 and on January 10th, 1911 the mill went into operation with four coating machines, making an annual production of 2,000 tons.

In addition to the factor of power, transportation facilities, and labour supply, it was said that in 1911, "the town will grant to bona fide enterprises, free sites, exemption from taxes and cheap power".¹

Tailor, harness and saddlery shops, carriage works, woollen and milling industries, foundries and machine manufacturers were all represented in Georgetown in the year 1911. Indeed, the many small industries that once supported the smaller rural villages and had been welded to their sites by the source of power, now tended to gravitate towards this larger urban centre.

Grocery, drug, and general stores also increased in number along with such specialty shops as W. L. Hamilton's

¹ Commercial Industrial Edition of Brampton, Georgetown, and Aclon. Publisher Unknown.

establishment which produced "confectionery, ice cream, chocolates, bon-bons etc." and the jewelry store of W. H. Foster. The appearance of these specialty shops are indicative of the overwhelming influence that Georgetown was now exerting over the surrounding district. It is not until this year that the pre-eminence of Georgetown became so significant as to allow the existence of such specialized shops.

By 1911 the town had six churches, a secondary and a public school, a town hall, one public library, fair grounds and a skating rink. Although the majority of these institutions were to be utilized by the population contained within the municipal boundaries, it is of interest to note how their growth kept pace with that of the population of Georgetown.

Acton was the other main urban centre of Esquesing Township in 1911 and supported a population of 1,720, somewhat larger than Georgetown. The leading industry was still Beardmore Tannery and in this year it is said to have been the largest tannery in the British Empire. Storey Glove Company Limited was the only other large industry. There were two banks, two schools, six churches and the general assortment of hardware, harness and grocery stores. Although having a slightly larger population than Georgetown, the village did not seem to attract the same number of industries. Almost all of the workers were employed by the Beardmore Tannery.

For the four decades previous to 1911, the rural

population of Esquesing Township had been declining in number. I believe that one may attribute this rural depopulation to economic rather than sociological conditions. The population (exclusive of Georgetown and Acton) had decreased from 5,239 in 1871 to 3,901 in 1911.

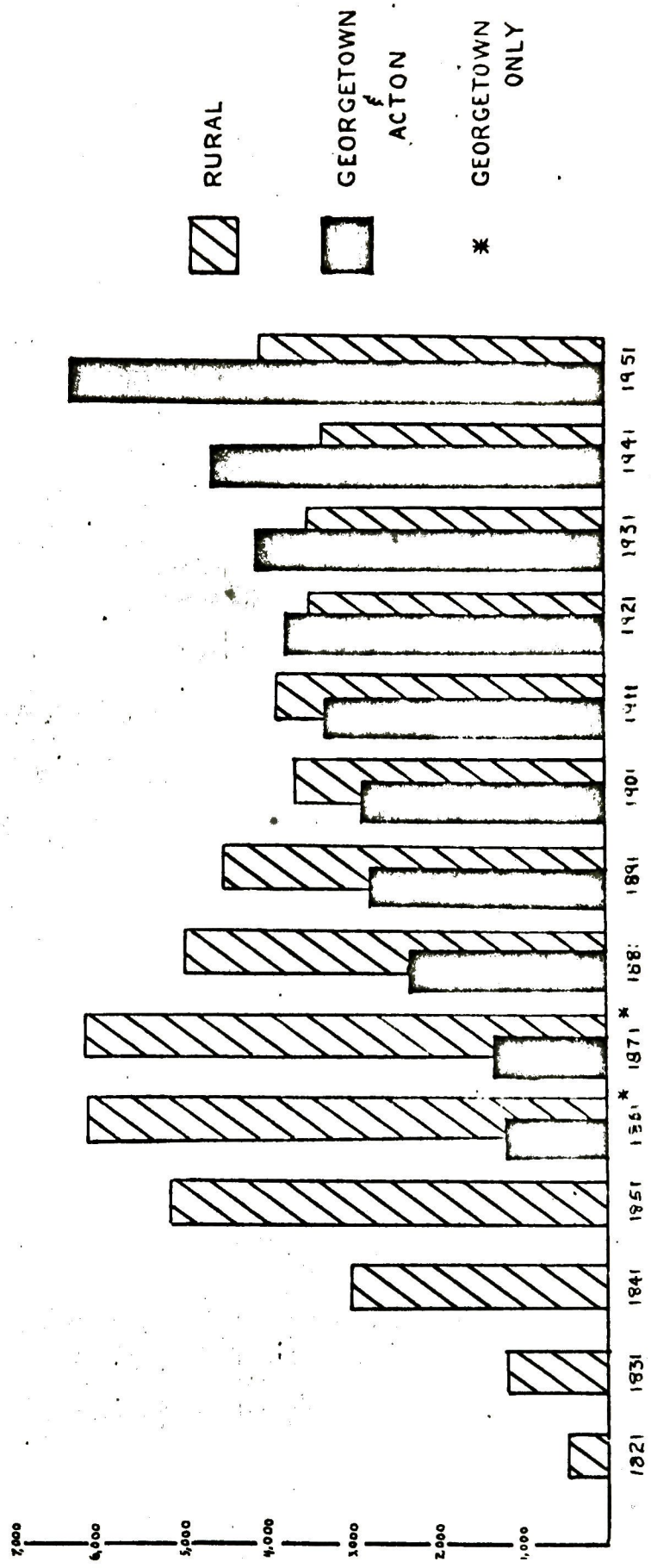
During these years, there was a real surplus in farm population. This phenomenon, hitherto unheard of in Esquesing Township, was brought about partly by the technological improvements and mechanization of agriculture. From this, agricultural production became much more efficient. Farm labour requirements were then decreased, causing a surplus of rural population.

As a direct result of these improvements, fewer "small" farms were in existence, many of them being amalgamated into larger holdings for more efficient utilization. From the table below it may be seen that the number of farms of 50 to 100 acres decreased from 315 in 1851 to 249 in 1911 while the number of 100 to 200 acre farms increased from 99 to 175 during the same period. Previous to the amalgamation of farms, each one of these smaller farms probably supported an entire family. However, when these holdings were sold, the families would be displaced. This again added to the surplus rural population.

TABLE II

<u>Size of Farm (acres)</u>	<u>1851</u>	<u>1871</u>	<u>1911</u>
0 — 10	32	78	105
10 — 50	85	96	33
50 — 100	315	271	249
100 — 200	99	149	175
200 plus	9	33	36

POPULATION TRENDS ESQUESING TOWNSHIP 1821 - 1951



FIGURE

The declining rural villages such as Stewarttown, Norval, and Glen Williams provided another source of surplus rural population. Although exact population figures are lacking for each individual village for this date, it may generally be inferred that their absolute population actually declined. To explain this phenomenon, the decline of the rural artisan class must be appreciated. It is true that the larger mills of these villages could still compete with those of Georgetown and Acton but it is the smaller class of tanners, shoe and boot manufacturers, wagon manufacturers and smithies that were overshadowed by the larger centres.

Paralleling the declining importance of the rural artisan was a decline in the population of the rural village. As this population figure was included in the census report of Esquesing Township it appears to the casual observer that only the agricultural population declined.

This surplus population was observed by Western Canada, the United States, and the growing urban centres of Ontario. The surplus population of the rural villages tended to migrate into the growing industrial centres of the United States and Canada, while the surplus agricultural population, caused by mechanization and farm amalgamation, settled mainly in Western Canada.¹

In the year 1911, the resources provided by the

¹ Cudmore S. A. Rural Depopulation in Southern Ontario. Transactions of the Canadian Institute. Number 2, Nov. 1912. Volume IX, Part 3, University Press, Toronto. April 27, 1912.

palaeozoic geology of the area were of commercial significance. The Terra Cotta Brick Company (1903) and the Halton Brick Company (1909) were utilizing the Queenston shale exposed at the base of the Niagara Escarpment for the manufacture of bricks. Both plants were located near the Chinguacousy-Esquesing Township line on Concession XI, Lot 28. In addition to having an excellent supply of this raw material, the location of these two plants may be directly related to the presence of a stream which supplied the necessary water for the manufacture of bricks. The proximity of the Hamilton-Allendale railway line facilitated the removal of the finished product to prospective markets. Almost any exposed Queenston shale in Esquesing Township may be utilized in the manufacture of bricks. However, the limitations imposed by the lack of an adequate water supply and an economical means of transportation concentrate the exploitation of this resource only in limited localities.

This fact is again supported by the site chosen by the Milton Brick Company Limited on Concession I, Lot 1. Here, transportation facilities and an accessible water supply have allowed the commercial exploitation of the Queenston shale. Little information is available concerning this plant but it is generally conceded that it was established in the early 1880's and soon rose to be, for a short time, the largest producer of bricks in North America.

The stone quarries of Esquesing Township were also in full operation by 1911. These industries are

distributed in a wavering line which extends across the township depending upon the accessibility of the rock.

In 1811, the Logan Quarries (Concession X, Lot 26), employed 45 men, 7 teams of horses and sold their stone throughout Ontario. Shanly's Quarry (Concession VII, west half of Lot 22) was serviced by a tramway to the Grand Trunk Railway. Stone taken from this quarry was used in the construction of bridges and culverts on the railway. Other quarries such as Stull's or Fleming's provided sandstone for the construction of such structures as the piers of the Fort Erie Bridge and the Parliament Buildings in Toronto.

By 1811 the lime kilns were producing large quantities of lime to be marketed outside of the township. Soon after the construction of the Grand Trunk Railway, two rival companies, Bescoby and Worthington, and Lindsay and Farquhar, began operations in Limehouse. At one time a total of three large draw kilns and eleven large pot kilns were in operation.

The lime kilns at Dolly Varden (Concession IV, east half of Lot 23) were the property of the Toronto Lime Company Limited. When the Grand Trunk Railway was completed, optimum conditions prevailed for the commercial production of lime. The kilns were built below the quarry, so that their tops were level with the floor of the quarry. The limestone was removed from the side of the escarpment, dumped into the tops of these kilns and the processed lime was removed through openings in the bottoms of the kilns. Exportation of the

finished product was facilitated by the construction of a siding from the railway line. By 1911 there are said to have been four large draw kilns built of blocks of dolomite and lined with firebrick.

CHAPTER III

PRESENT LAND USE

(A) BACKGROUND (1911-1954)

From 1911 onwards the number of rural inhabitants in Esqueasing Township remained comparatively constant. The urban population of Georgetown and Acton however, continued to steadily increase.

After the war of 1914-1918, there was naturally a re-adjustment from a war to a peace time economy. The post-war boom was immediately followed by a short severe depression. During the 1920's prosperity gradually increased, culminating in the 1929 boom. It was during this period that many of the present day industries of Acton and Georgetown were established. It was also in this period that agriculture suffered particularly severely because of over-expansion. This resulted in increased surpluses, falling prices, and restricted markets.

The decade of 1931-1941 was one of depression, unemployment and restricted export trade. However, the depression did not seriously affect the agriculturists of Esqueasing Township. Although there was a decrease in the acreage of oats, barley and potatoes, there was also a slight increase in hay production. Indeed the rapidity with which the urban centres had grown, in addition to improved transportation facilities had fostered an increased interest in dairying. The per capita consumption of milk

between 1928 and 1938 had enjoyed a marked increase because of a guaranteed fat content, pasteurization, improved sanitation standards and an increased emphasis on the nutritional value of this product.¹

There was a decrease in the production of potatoes in spite of the large market provided by Toronto. As previously stated, this may be related in part to the texture of the soils of Esquesing Township and competition from regions with light textured (and therefore better suited) soils. However, being for the most part heavy textured, the soils of the area under study were well suited to the production of hay and pasture crops.

The rapid increase in the acreage of wheat and oats, cultivated during the decade previous to 1951, may be directly related to the markets caused by World War II and the post-war boom.

To-day the agricultural activities of Esquesing Township are concentrated in mixed farming with an emphasis on dairying. For the most part, the area under study ships fluid milk to Toronto via the well developed road network. Some beef herds are found scattered throughout the township but they do not appear to dominate any single section of the township. On the farms located adjacent to the Niagara Escarpment, beef cattle and dual purpose breeds appear to become more predominant than on other land forms but even here, cattle raised for dairying purposes tend to be of greatest importance.

¹.....
Op.Cit. Reeds L.C. Page 80.

Several farms concentrate on the production of swine or sheep. However there appears to be no determining factor for the location of these farms other than personal preference. The number of horses utilized as draft animals has continued to decline, a trend which may be directly related to the mechanization of farms.

It is also of significance to note the rise in rural population during the 1941 to 1951 period. Improved road transportation combined with the modern improvements in, and almost universal distribution of automobiles, has resulted in a few people becoming suburban dwellers. That is, many of the workers of the industrial and commercial centres living outside of the town boundaries, are building homes on township property. They are also moving into the centres of Limehouse, Glen Williams, Norval, Hornby etc. Since their numbers are included in the census returns of Esquosing Township, this may account in part, for the rise in rural population.

(B) AGRICULTURAL LAND USE

For the most part, an explanation of the present agricultural land use of the area under study will take the form of an interpretation of the map "Land Utilization in Esquosing Township". Certain sections of the map have been planimetered in order to determine the proportional land use that occurs on the various land classes delineated in figure six. In each case a "typical" section has been chosen to be

TABLE III

Land Use	Class I (total acres plannedmetered - 1108)		Class II (1078)		Class IV (966)		Class V (350)		Class VI (321)	
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
H	322	29.0	307	28.5	104	10.8	23	6.6		
Gw	180	16.2	91	8.4	9	0.9	17	4.9		
Gs	254	22.9	177	16.3	147	15.2	22	6.6		
F	121	10.9	50	4.6	212	21.9	4	1.2	255	79.4
P	148	13.0	378	35.0	430	44.6	239	68.3		
X			3	0.3	3	0.3	4	1.2	66	20.6
H	50	4.5	42	3.9	28	3	24	7		
O	9	0.8					5	1.4		
T					2	0.2				
N	22	1.9	17	1.5	13	1.5	8	2.3		
Railway			10	0.9	9	0.9				
Road			3	0.3	9	0.9				
U	2						4	1.2		

planimetered so that a fairly accurate interpretation of the land use for the entire township may be presented. A summary of the results obtained may be seen on Table III. The limitations of such a plan will come to light as the land use is discussed - no single section may exactly typify all other sections of the same land classification.

It is of significance to note that no Class III land has been planimetered. This class was omitted simply because no "typical" area could be found. In almost every instance a different type of land use has developed with the result that the adjustment of man to this class of land will be explained as the various delineations of the land use map are interpreted.

Winter Wheat (Gw)

The crop classified under this denotation is the winter wheat that had been planted in the fall of 1953. This crop was given a separate classification simply because it was believed that the Niagara Escarpment might have exerted a limiting influence on its cultivation. However, it was found that wherever Class I land occurred, the same proportion of cropland was under winter wheat. From the table given on page 97, 16.2 per cent of Class I land is under this crop.

Although winter wheat may be grown under a wide range of soil conditions, the most suitable soils should have a good water holding capacity in addition to fair to good drainage. The limitations provided by imperfectly and poorly drained soils on the cultivation of this crop are

well illustrated in the accompanying table. Class II land which is imperfectly drained has only 8.4 per cent of its area under winter wheat while the poorly drained Class V land has only 4.9 per cent. The inability of Class IV land to adequately support the cultivation of winter wheat is well illustrated by the figure 0.9 per cent.

Since climate provides optimum conditions for the cultivation of this crop, it is evident that soil is the main determinant in the distribution of winter wheat.

For the most part, the winter wheat grown in the area under study is sold to the milling industry. The straw which is separated from the head during the thrashing process is often utilized as bulk feed for cattle or in covering the barn floor to be impregnated with the waste from the livestock and later spread on the open field to act as a natural fertilizer.

The cultivation of winter wheat also limits soil erosion which might result during the spring runoff. By spring, this crop has grown to sufficient proportions to protect the topsoil from water erosion.

Spring Grain (Ga)

The remainder of the small grains are grouped into this classification. By the 1951 census, the following acreages were under cultivation in Esquesing Township; barley - 378 acres, rye - 45 acres, oats - 7,425 acres, mixed grains - 3,229 acres. Although these figures do not

apply to the land use map of 1954, I believe they are a close approximation. Since the majority of the agriculturalists of the township follow a comparatively efficient rotation programme, the crops grown in each individual field will naturally change from year to year. However, since many practice a three or four year rotation, figures and distributions may generally approximate that of 1954.

One only has to realize the acreage of these small grains cultivated in Esquesing Township, to understand the importance of livestock farming.

The cultivation of barley has declined since 1891 (except for a slight increase between 1911 and 1931) and is continuing to do so. Although barley is grown primarily for feed, it naturally comes into competition with the more suitable oat and corn crops. The only place that barley may successfully compete with the cultivation of oats and corn is when climatic conditions are more harsh and consequently are more favourable to barley. However, in Esquesing Township both oats and corn are provided with suitable climatic and edaphic conditions with the result that the acreage under barley is constantly declining.

The present production of rye is almost negligible and where it does occur it is usually utilized as pasture or a green manure crop. Together, barley and rye cover only 423 acres while the total acreage covered by oats and mixed grains is 10,754.

Since by far the greatest proportion of the spring grains produced in Esquesing Township are composed

of oats and mixed grains (much of which is oats) the general distribution of this unit is closely dictated by the requirements of the oat crop. Oats are produced almost exclusively as a feed for livestock, mostly fed on the farms where it is cultivated. Because of its bulkiness, comparatively low value and limited industrial utility, it seldom is produced as a cash crop.

Since the highest yields are obtained on loamy soils, 22.9 per cent of Class I land is under this crop. It also produces large yields on the heavy, moisture-retaining soils of Class II land, with the result that 16.5 per cent of Class II land is occupied by oats. This crop is generally less specific in its soil requirements than wheat with the result that it is cultivated on 15.2 per cent of Class IV land.

Since the largest income from agricultural produce is obtained from the dairying industry, the importance of these crops which are utilized extensively for livestock feed cannot be overemphasized. The straw that remains after thrashing is put to the same use as that of the winter wheat crop.

Hay (H)

Hay is possibly the most extensively cultivated crop (with the exception of "improved" pasture) in Esquesing Township. In 1951, 12,518 acres were under cultivation. The term "hay" simply refers to the above-ground parts of

grasses, legumes and occasionally other plants, dried for use as stock feed. The production of hay has increased, paralleling the rise in importance of dairying. For the most part, this crop fits well into the rotation programme as the greatest proportion of plants composing this unit (timothy, alfalfa, and clovers) are high in nitrogenous content and consequently return plant nutrients to the soil.

The main and probably only use to which this crop is put, is in the feeding of livestock. The hay is cut, allowed to dry and then baled and stored in the barn to be consumed during the winter. The importance of dairying to Esquesing Township is well illustrated by the fact that 29.0 per cent of the Class I land planimetered was covered by this crop. In the case of Class II land it covers the second largest acreage of any unit in the classification (28.5 per cent). However, due to the droughtiness and infertility of Class IV land, it only covers 10.8 per cent of the total number of acres.

After the hay is cut, the cattle are often allowed to forage on the remaining stubble until the soil is ploughed for winter wheat, or the snows cover the ground. This stubble also provides a protective cover throughout the winter and reduces soil erosion.

Row Crops (R)

This classification includes both corn and potatoes. However, when the field work was completed in

the summer of 1954, it was found that the proportion of land under potatoes was negligible. Consequently, almost without exception, the sections delineated as "row crop" are fields of corn. The reluctance to cultivate the potato has been previously explained.

Corn, as it occurs in the area under study, is mainly utilized for the feeding of livestock. It is not only an excellent grain feed crop, but it is also an important silage crop, indeed, on some farms it is even used as a fodder crop.

Table III does not give a true picture of the distribution of this crop. From this table, one would assume that corn is best suited to the poorly drained soils of Class V land. This however is not so, as corn demands good soil aeration while poorly drained soils are too cold in the spring to permit plant growth.

I believe the main reason for the occurrence of this crop is that it fits well into a system of crop rotation, while at the same time provides an excellent feed for the livestock. It leaves the soil in good condition for winter wheat or spring grain to follow since being a cultivated crop, "the necessity for ploughing preparatory to the seeding of the cereals is eliminated".¹

Orchard (O)

During the initial stages in the development of

¹ Klages K.H.W. Ecological Crop Geography. The MacMillan Co. N.Y. 1951. Page 396.

agriculture in Esquesing Township, an orchard almost without exception was located adjacent to the farm buildings. These orchards provided an ample supply of tree fruits for local use and very little was ever exported. Although many areas have been delineated on the land use map as being covered by orchards one finds on close observation that they are not being cared for and gradually, tree by tree, they are disappearing.

Two main reasons account for the general apathy that the agriculturalists have shown towards fruit farming. The first is that the business of fruit culture is too demanding on the labours of a farmer concerned mainly with mixed farming. The better suited soils and climate of the Niagara Fruit Belt provide too keen a competition. The second reason is that, in most cases, the species of fruit planted by the early agriculturalists has long been surpassed in quality and quantity by the fine breeding that has taken place in the various fruit belts.

In spite of these limitations fruit culture has developed in certain localities. On Concession II, Lot 11 there is a large orchard which may be explained only by the protection offered by the Niagara Escarpment from the prevailing westerly winds. This orchard has been planted on a narrow section at the base of the escarpment on soils that are steeply sloping and have been developed from weathered Queenston shale. Naturally erosion is a problem.

The orchard found on Concession III, Lot 12 is

illustrative of the close adjustment of agriculture to the physical environment. Although the climate does not provide optimum conditions for fruit culture, the soils (Class III) adequately support this crop.

A fairly large orchard occurs on Concession VI, east half of Lot 15 and another on Concession VIII, Lot 17. In both cases the orchards are ideally located on Class III land.

Pasture (P)

Although the present land use map of Esquesing Township has not been entirely planimetered, it is obvious that the areal extent of pasture is more than any other single unit. Both rough and improved pasture have been classified together with the result that the following account for the occurrence of this land use; land that is too wet for cultivation, land that is too droughty and rough to produce satisfactory crops, soils that are too shallow to permit cultivation, and the position of this crop in the rotation programme of each farm.

In the case of Class I land, the 13 per cent of the land under pasture may be entirely attributed to the position of this crop in the rotation programme. In this instance, all of the pasture is "improved" often taking the form of a hay field in which the farmer has allowed livestock to graze. This is often the case when a poor crop of hay is realized, and the farmer does not deem it worthy of baling.

Class II land has 35.1 per cent of its area under pasture, which is, for the most part, concentrated on the sides of stream valleys and on the more imperfectly drained sites. Similarly in the case of Class V land, pasture exists on land which is too wet to allow the cultivation of any crop. The abundance of moisture permits the growth of long succulent grasses, ideal for the foraging of dairy cattle.

Class IV land also supports a large proportion of pasture (44.6 per cent). During the era in which wheat was the main cash crop, much of this land was unwisely cleared and put under wheat cultivation. To-day slopes are often too precipitous to allow the mechanized agricultural implements to cultivate them without endangering the operator. These facts, in addition to the inability of this land to adequately support cultivated crops, result in large sections being covered by rough pasture.

Some patches of pasture do occur on Class VI land in spite of Table III. Again, it usually takes the form of "rough" pasture which has developed on shallow soils that have unwisely been cleared.

Woodland (F)

For the most part, this unit may be generally divided into farm woodlots and "natural" woodlands. Farm woodlots occur mainly on Land Classes I, II, and III. They are usually more regular in shape than the natural woodlands and are tolerated simply because they provide shade and forage

for the cattle, and a source of sugar maple, firewood and lumber for the farmer. Very few farmers in Esquecing Township maintain their woodlots with a view to conservation. Only two, in the entire township are managed through the guidance of the Ontario Department of Lands and Forests.

The "natural" woodland occurs on land that man has deemed unsuitable for cultivation, or, if by chance it has been cleared, it has now reverted to an unnatural sequence of plant succession.

Class VI land accounts for the largest proportion of woodland in the entire township with approximately 79.4 per cent of the area of this land class being covered. Shallow, or poorly drained soils and irregular relief provide the main impediments to cultivation. Because of the irregularity of surface configuration and the density of the woodland, these sections are not extensively utilized for the pasturing of cattle.

The woodland found on Class V land is also not intensively utilized. Again the limitations of planimetry on the land use on a "typical" land class comes to light, as one would necessarily conclude from the table given that very little of the Class V land is under forest cover. Actually this is not so. If the area tends to dry up at all in the summer, it is usually cleared and used to support a pasture crop. However, in many cases, the land is perpetually in a swampy condition, and the cedar swamps that exist, are entirely unsuited for grazing purposes.

I should also mention at this point, the reforestation projects that have been delineated by - Tp. Their occurrence is extremely limited. At the time of the survey only three were in evidence; Concession II, Lot 16, Concession IX, Lot 29, and Concession XI, Lot 13.

Idle Land (X)

Generally there are two main factors that account for the occurrence of idle land; land that has been cleared and has been found unsuited to cultivation, and land in the close proximity to urban centres.

Since, in the initial stage of agricultural development, soil surveys were not available, much of the land was unwisely cleared and an attempt at cultivation was made. Such is the case of large sections of Class VI land. After it had been determined that crops could not be cultivated successfully on these shallow soils, farms were abandoned and the land was allowed to remain idle.

Much of Class III land has also suffered in this way. Large areas near Concession III, Lots 9 to 11, and Concessions IV and V, Lots 23 to 25 are now in idleness. In this case droughtiness and infertility limit agricultural development.

The other main determinant in deciding the location of idle land is the presence of the two main urban centres, - Acton and Georgetown. As both towns expect a future programme of expansion, large sections adjacent to these

urban centres remain idle awaiting sale and subdivision.

Increased suburban development around Milton Heights may account in part, for that small section of idle land.

Market Gardening (M) and Poultry (Su)

Again, in the case of these two agricultural activities, there has been a close adjustment of land use to physical environment. By far the greatest concentration of market gardening in Esqueving Township occurs on the Norval Sand Plain. The soils (Class III) that have developed on the deltaic deposits are well suited to the cultivation of these crops.

Similarly, the greatest amount of poultry farming occurs on the sandy area found on Concessions VI and VII, Lots 14 and 15. As most of the poultry houses serve mainly as feeding bins, the chickens are forced to spend much of their time in the open, often exposed to the elements. Since poultry are particularly susceptible to disease precipitated by damp conditions, a soil with excellent internal drainage is essential. The sandy soils provided by Class III land fulfill this requirement.

However soils alone cannot account for the occurrence of these two features of land utilization. Indeed the proximity of the large urban markets of Hamilton and especially Toronto have probably provided the principal impetus for this land use.



Photo No. 17. Holstein cows, a breed found throughout the entire township under study.

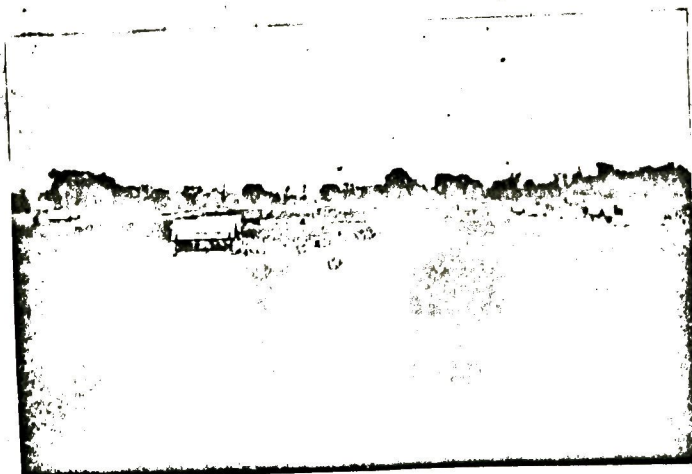


Photo No. 18. Poultry found on Concession VII, Lot 14. Class III land is well suited for this type of land use.

Tilled (T)

At the time of the survey during the summer months of 1954, the land under this delineation had just been turned in preparation for a crop.

Miscellaneous

I believe that it is here that mention should be made of the Glenspoy Mushroom Farm that is located on Concession III, west part of Lot 11. This farm is owned by R. Reed and produces 120,000 pounds of white mushrooms annually, all of which are sold to Campbell's Soup Company Limited of Toronto. The plant covers 40,000 square feet of floor space and employs eight men.

Esqueping Township also has the second largest apiary in Ontario. This is the Anderson's Apiaries owned and operated by F. A. Anderson and located on Concession VII, Lot 2. His hives (36 separate locations) dot the landscape wherever alfalfa, sweet clover and flower growths are the thickest, and extend from Guelph to Lake Ontario and from Streetsville west to Cedar Springs. A total estimate of the amount of honey harvested per year is difficult to compute simply because the weather has such an overwhelming influence on production. Anderson maintains a total of 1600 hives or colonies usually receiving over 25 pounds of honey per hive.

(C) NON-AGRICULTURAL LAND USE

Recreation (Rec)

Only four sections of Esquesing Township fall into this classification. "The Breezes" (Concession II, west half of Lot 28) is a commercialized park which has capitalized on the presence of Fairy Lake. Boating, picnic and playground facilities are provided.

The area to the south of Georgetown is a private nine-hole golf course. The dissected post-glacial spillway has provided a section of sufficient surface configuration to allow the construction of suitable fairways, greens, and hazards.

The section found on Concession V, Lot 31 was established as a Ukrainian Children's Camp in the summer of 1954. The Y.M.C.A. Camp on Concession XI, Lot 13 has been annexed by the town of Georgetown and no doubt will soon be subjected to urban subdivision.

There are many opportunities for the development of recreation within Esquesing Township. The Credit River Valley is relatively unused except by private individuals and development of any facilities are all but lacking. Proper placement of dams in the vicinity of Glen Williams would provide bodies of water of sufficient extent and depth to warrant the establishment of recreational facilities. In addition, such dams would enable the waters of the Credit River to be more easily controlled and more fully utilized.

The Niagara Escarpment also provides numerous

sections that could easily be developed into parks. The area surrounding the hamlet of Limahouse could be transformed into a large park of historical interest. The presence of old abandoned lime kilns and large caves provide ready made attractions for the tourist.

Quarries (C)

To-day there are only two quarries in operation, extracting the sandstone for purposes of construction. The one most intensively utilized is Syke's Quarry on Concession X, Lot 26, while the one located on Concession V, Lot 21 has only recently been put into operation. All of the other quarries mentioned in the historical geography of the area under study have been shut down. Similarly, there is no lime kiln in operation in Requesing Township to-day. The Toronto Lime Company Limited, who owned the large kilns at Limahouse and Dolly Varden operated until 1932. In this year they were sold to the Cypsum, Lime and Alabastine Company Limited who shut them down to eliminate competition for their Beechville plant.

Sand and Gravel Pits

For the most part, the sand and gravel pits of Requesing Township have been utilized only by the local inhabitants and are abandoned to-day. Their distribution may be easily traced as mainly occurring on the sections covered by the post-glacial spillways.



Photo No. 19. A section of Industrial Sand and Gravel Company Limited. A firm that utilizes the glaciofluvial deposits of the Georgetown Spillway.

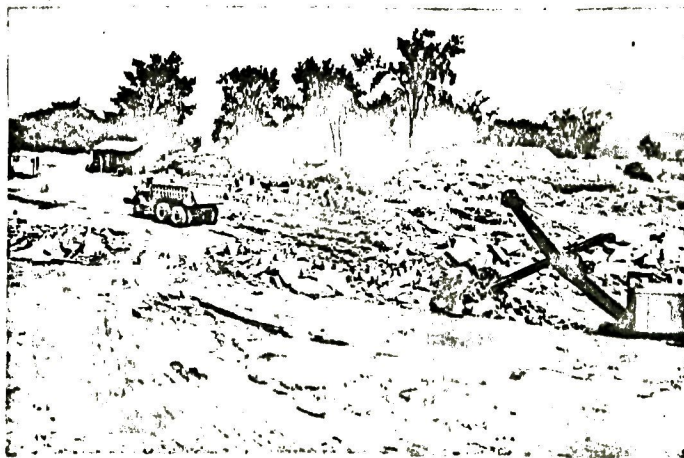


Photo No. 20. Quarry found on Concession X, Lot 26. Here the Medina sandstone is extracted to be utilized in the construction industry.

At the time of the survey only one, the Industrial Sand and Gravel Company Limited (Concession X, Lot 24) was in operation. This company extracts the sand and gravel that occurs in the Georgetown Spillway and utilizes a tributary of the Credit River to wash these deposits.

Transportation

The growth of transportation facilities up until the year 1911 have already been discussed. Only a few facts of historical interest remain. In 1921 the Grand Trunk Railway was taken over by the Canadian Government and all lines were amalgamated into the Canadian National Railways. The Toronto Suburban-Electric Railway was opened in 1917, running just to the south of the Toronto-Stratford Line of the Canadian National Railways and ceased operation in 1930. Highway No. 7 was built in 1923 and Highway No. 25 in 1952.

A new four-lane highway is now being planned which would cut Highway No. 25 between Acton and Milton. Although no statements have as yet been confirmed, it is expected that this highway (401) will stretch 542 miles from Windsor to the border of Quebec Province.

Miscellaneous

Industrial expansion is also expected in the vicinity of Terra Cotta (Concession XI, Lot 27). The land previously owned by the Halton Brick Company, which ceased operations in 1934, has been purchased by a syndicate composed

of Ontario and New York business men. They plan to operate a plant which will employ a minimum of 50 men and will utilize the Queenston shale in the manufacture of rug bricks.

Natural gas has also recently been discovered in Esqueusing Township by T. Soynuck. However, possibilities of future commercial exploitation of this resource must necessarily remain limited until the full extent of the reservoir is determined.

Limehouse

Since the lime kilns were closed down in 1932, this settlement has slowly declined. At present there is no industry in Limehouse and only two of the residents (both of whom operate general stores) are employed in this hamlet. For the most part, those residing in Limehouse are employed in Acton, Georgetown, Brampton, or Milton.

Glen Williams

This settlement is somewhat larger than Limehouse but again its main function is to act as a residential village for many who are employed in the near-by industrial centres. There are however two small industries now in operation in Glen Williams - the Glen Knitting Mills and Apple Products. The latter industry employs workers for about four months of the year in the production of pie fillings and other products made from apples.

Norval

In 1929 the Noble Flour Mills were destroyed by fire and were never rebuilt. With this loss of employment, just previous to the depressional era of the 1930's, many inhabitants left this village. However, recently there has been an increase in population sufficient to cause a number of new homes to be built. Again the main function of this village is to provide residential facilities to a population employed elsewhere. However with the annexation and proposed development of a large section of Esquesing Township by Georgetown, this village should rapidly rise in importance as an industrial and commercial centre.

The remaining centres of population (other than Georgetown and Acton) require little mention at this time. For the most part they all provide the same function - that of "residential villages". Milton Heights is rapidly growing because of the increased importance of Milton. However, the general class of housing is of a low grade, typical of that type which develops on the periphery of an unzoned industrial centre. Hornby, Ballinafad, Speyside and Ashgrove generally consist of a few gas stations and two or more farm houses. Whaley's Corners and Mansewood provide absolutely no urban function - indeed, other than being map place names, they are non-existent.

(D) AN URBAN STUDY OF GEORGETOWN

General Introduction

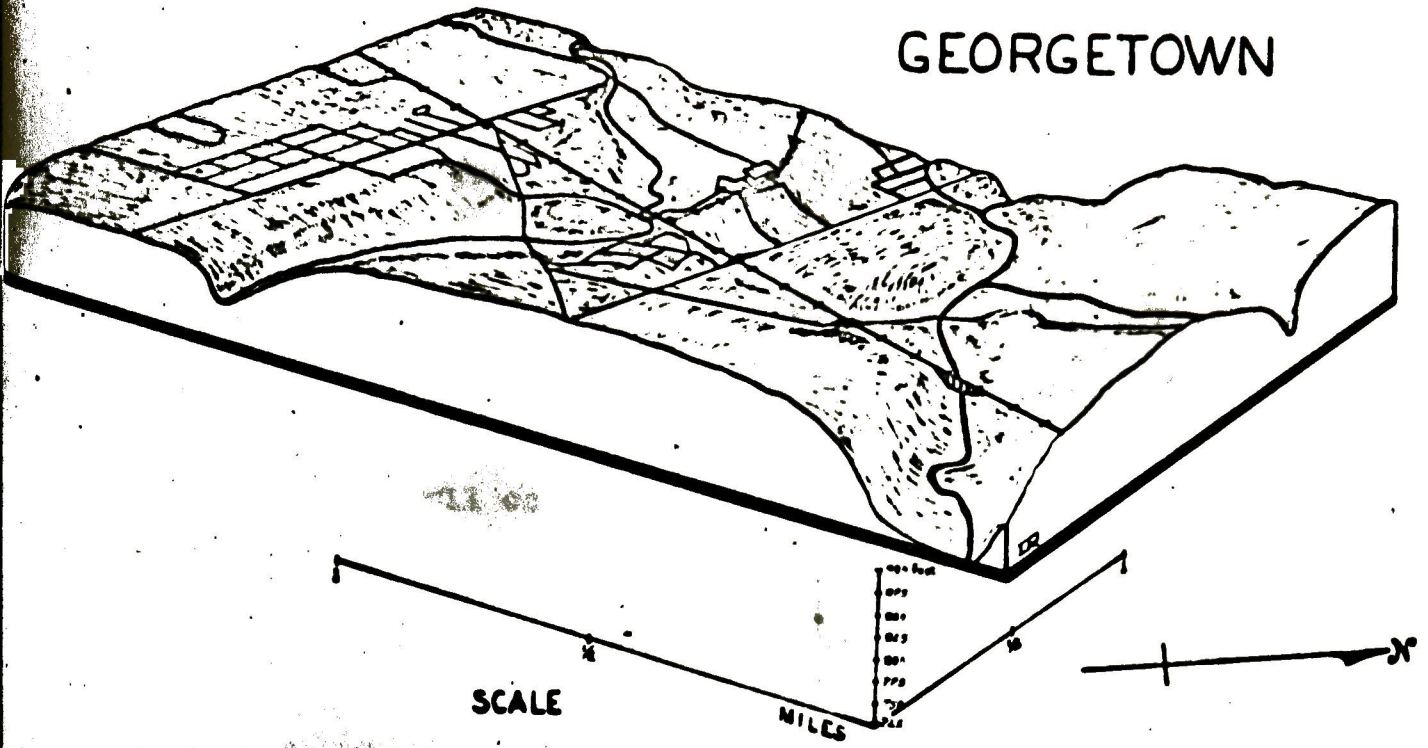
Georgetown is situated at the junction of two railway lines of the Canadian National Railways. The Hamilton-Allendale line runs in a north-south direction while the Toronto-Stratford line provides east and west service to Montreal and Chicago. Georgetown is adjacent to the greatest concentration of people in the Dominion of Canada. Consequently a well-suited site is provided for industry which may economically utilize truck and railway transportation in addition to a readily available supply of labour. Georgetown was incorporated as a village in 1864 and became a town in 1922. The population, according to the 1951 census numbers 3,452.

Physical Setting and Street Pattern

Georgetown is situated on a post-glacial spillway which has been actively dissected for many centuries by Silver Creek. The Credit River has also reworked these sediments but its affect is limited to the northern section of the town. Consequently the valley of Silver Creek has provided possibly the most influential physical control in determining the urban pattern of Georgetown.

It is believed that it was this creek rather than the Credit River which was utilized by George Kennedy as a source of power for his saw mill. This would account for the fact that Georgetown has grown "straddling" this creek, rather

BLOCK DIAGRAM OF GEORGETOWN



BLOCK DIAGRAM OF ACTON

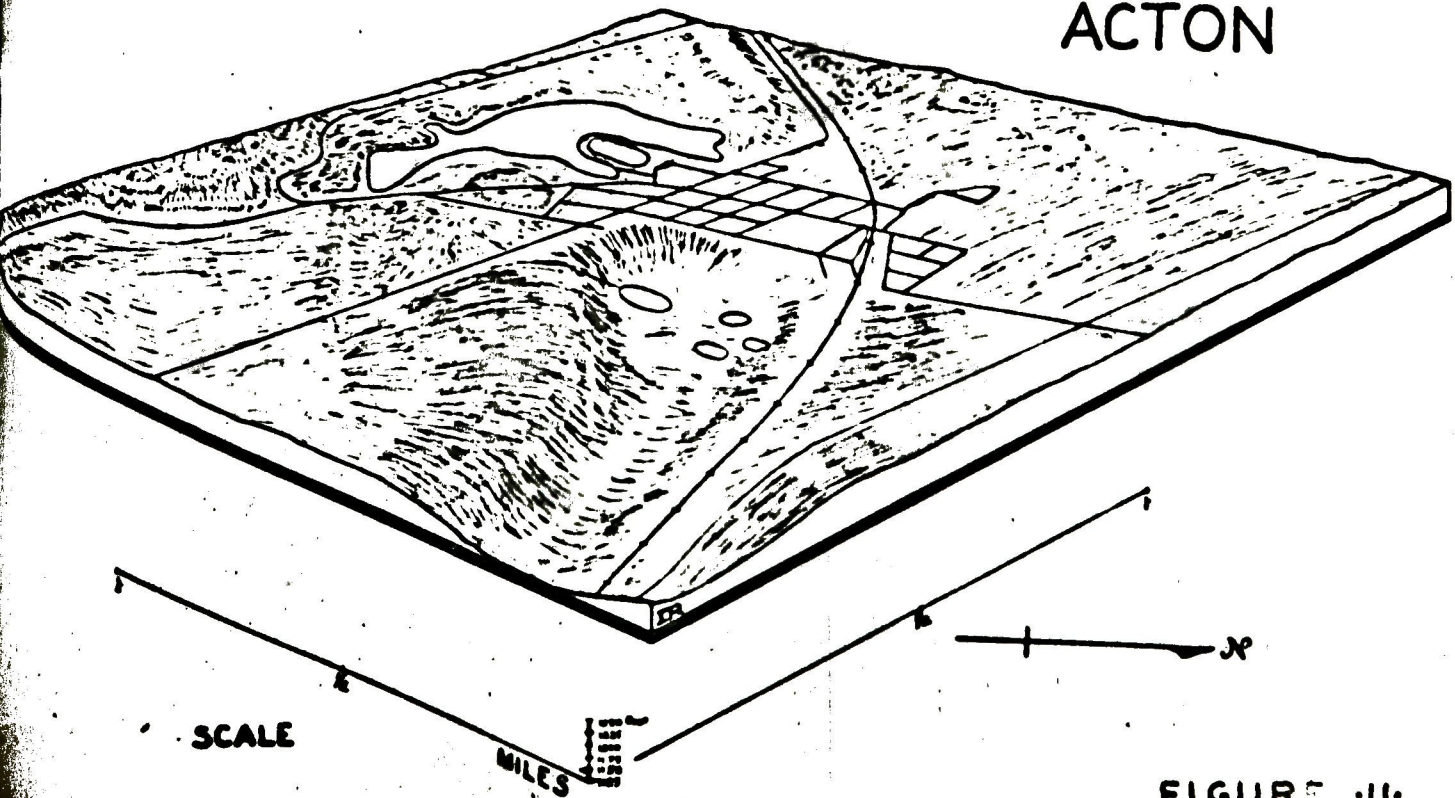


FIGURE 11.

than on either bank of the Credit River.

A grid pattern of streets has tended to develop wherever existing conditions would permit. However, due to the influence provided by existing surface configuration, both lines of the Canadian National Railways, and the pioneer road which ran from Guelph to Toronto (Highway No. 7 or Guelph Street), a separate base line has tended to develop for each grid pattern.

A well established grid pattern has developed, extending from Maple Avenue to Young Street and between Main Street South and Charles Street. Any further growth of a similar grid pattern in this section would be limited by the valley to the south of Valley View Road, the swampy, depression area north-west of Young Street and the fairgrounds to the west of Charles Street. Similarly, uniform grid development is limited to the east by the existence of Silver Creek Valley.

The street pattern found between the Eighth Line (Main Street) and the Ninth Line is of great complexity. By studying the street pattern found on the functional map of Georgetown (figure 13), one may realize the limitations imposed by the valley of Silver Creek, and the influence of Highway No. 7 and the Canadian National Railways' lines. Chapel Streets East and West and Mill Street tend to form a grid pattern by joining Guelph Street at right angles. However this pattern is immediately interrupted by the creek valley. Consequently, John Street forms an angle of approximately forty-five degrees with Guelph Street to

provide a routeway which will enable the valley to be easily crossed. Queen Street, Albert Street, Durham Street and Maple Avenue parallel this direction until King Street, which in turn parallels the railway line, tends to exert its influence by having Union, Elgin and Sarah Streets join it at right angles. John Street "bends" under the railway and again disrupts any grid pattern that tends to develop.

The influence of the valley of Silver Creek is exerted once more by limiting the eastward extension of Dufferin, Ewing and Kennedy Streets on one bank and Elm and College Streets on the other. North of Rosetta Street, the influence of the Credit River Valley becomes effective as the land slopes abruptly down to the river.

From the foregoing explanation and the accompanying map (figure 13) one can readily see how the street pattern of Georgetown has been subjected to many physical and cultural factors. On the extreme western and eastern edge of town, the land is well drained, comparatively flat and would provide an excellent site for residential or industrial development.

Components of the Functional Plan

Commercial Core

The commercial core of Georgetown is more nucleated in shape than that of Acton. This shape results from the convergence of two "main" streets which concentrate the flow of traffic into this area. However, the cartographic

representation of this unit is somewhat misleading as the greatest density of commercial establishments occurs along Main Street South between Church Street and James Street. Although the function of the entire core is commercial in nature, the competition from this main section has limited the relative importance of the remainder of this unit. Components of this commercial core provide the usual proportions of clothing, hardware, grocery and drug stores, restaurants, recreational and financial establishments and mail order offices.

Outlying Service Centres

The outlying service centres are, for the most part, gas and service stations. The four that occur on Guelph Street and the ones on King and John Streets are all service stations. The one on Wesleyan Street is an auto body repair shop while the establishment on Young Street is an electrical appliance repair shop.

The distribution of these establishments (exclusive of the electrical and auto body repair shop) is controlled by the presence of the most heavily travelled roads. As Guelph Street is the section of Highway No. 7 found within the municipal boundaries, it is the main route taken by "through" traffic. John Street is the main road joining Georgetown to Glen Williams, Terra Cotta etc. (via the Ninth Line), a fact which may account for the existence of the service station at Victoria Crescent. The station on King Street simply consists of a pair of gas pumps in front of

a small shop and is of limited commercial significance.

Outlying Retail Centres

With only one exception, these outlying retail centres are grocery stores. The establishment situated at the convergence of Guelph and Main Streets is the retail sales office of International Harvester farm machinery. All of the others are "neighbourhood" grocery stores except the one located on Highway No. 7 opposite the Dominion Seed House Company Limited. This is an I.G.A. Supermarket which was built with the intention of future expansion into a small compact shopping centre. As this section of Georgetown continues to expand, I would predict a paralleled growth of this shopping centre to form a commercial core.

Residential

(1) First Class Homes - Georgetown has a greater proportion of first class homes than Acton. By way of explanation, I can suggest no other reason than the diversification of industry which has been so evident throughout the history of Georgetown. Such a diversification would allow a higher level of income to be more evenly distributed among the inhabitants while the pre-eminence of a single industry (Beardmore Tannery) in Acton would concentrate the profits in the hands of a few shareholders, the majority of whom were probably non-residents.

A concentration of these first class homes is found along Maple Avenue and Valley View Road from Main



Photo No. 21. Main Street. The most important section of the commercial core of Georgetown.

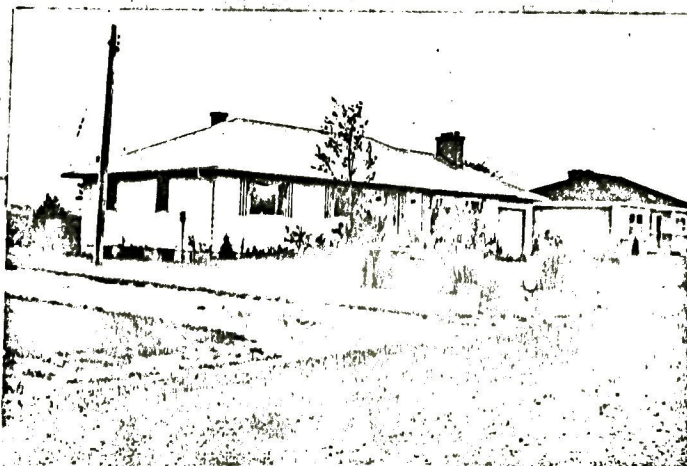


Photo No. 22. A typical first class home.

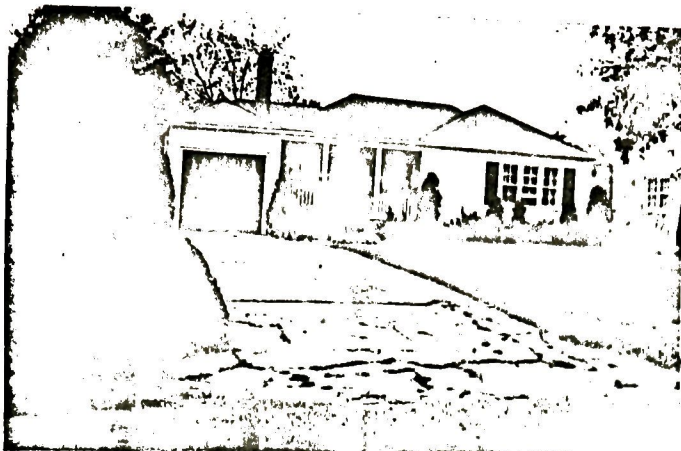


Photo No. 23. Second Class Home.

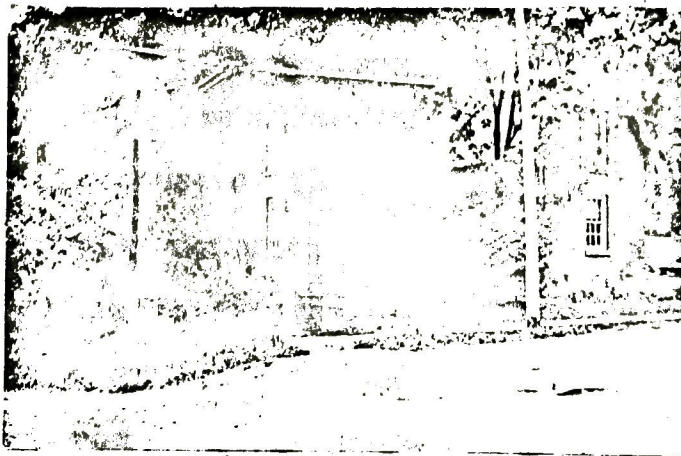


Photo No. 24. Third Class Home.

Street out past Parkview Boulevard. They have all been built on Class I land and are, for the most part, new homes of high value. Similarly, the isolated occurrences of first class homes throughout the town are usually new homes of high value.

(ii) Second Class Homes - The largest proportion of homes fall into this second classification. It is here that the limitations of such a general and subjective classification come to light for it is in this unit that one finds the greatest range in dwelling types. In any event, large proportions of both old and new homes fall into this category. There is no definite pattern to their distribution as they occur in any location, interspersed between the first and third class homes.

(iii) Third Class Homes - Those found to the southwest of Main Street are, for the most part, very old middle class homes that at one time tended to be first class housing. However simply because of their antiquity and poor upkeep they have naturally deteriorated. Similarly, third class homes south of the Stratford-Toronto railway line are generally second class homes that have deteriorated through neglect. The proximity of the railway would also lower the value of these homes.

Those occurring north of the Stratford-Toronto railway line appear never to have been of very substantial construction. Although they are generally more recent than those previously mentioned, they have probably deteriorated

faster. This cheaper housing may be related to the proximity of industry and definitely, to the railway line.

Similarly, the homes to the north-west of the Ninth Line have never been of very substantial construction. This housing is typical of that found on the periphery of a town which has not been zoned for residential establishments.

Industry

The industrial establishments of Georgetown tend to locate near the railway lines because of their dependence on these transportation facilities. The greatest concentration of industry is therefore near the yards of the Canadian National Railways.

Smith and Stone Limited employs over 600 individuals and has located several plants and the head office in Georgetown. Although to-day it is the largest single employer in Georgetown, the plant had a simple beginning in 1920, when a staff of 25 manufactured cast-iron conduit fittings. Later production branched out into all types of porcelain parts which eventually supplanted many articles that had always been imported.

Since 1920, the factory has been enlarged nine times, to take care of increased business and expansion into a diversified line of products for the electrical trade. Such articles as wiring devices, porcelain brackets and ceiling units, refractory porcelain and stove parts, conduit fittings, cast iron lanterns and brackets are just a few of the products manufactured.

The ceramic industry is contained in one of the longest established plants of the firm. There are four main requirements for this industry; clay, transportation facilities, a suitable labour supply and a market. The Canadian National Railway imports clay, while export of the finished product is accounted for by both rail and road transport. Georgetown itself, in addition to centres as far away as Cheltenham and Brampton, supply the necessary semi-skilled labourers. There are five graduate engineers continually carrying out research. With electrical appliances becoming such an integral part of our modern life, the marketing of these finished products does not present a serious problem.

In the summer of 1954, a \$500,000 plastics plant was completed in Georgetown by Smith and Stone Limited. The products manufactured range from Fiberglas reinforced aircraft slots to tooth brush handles.

The old industry known as the Barber Paper and Coating Mills Limited was purchased in 1912 by Provincial Paper Limited. At this time there were two plants in operation; the "Lower Mill" (adjacent to the Credit River) and the "Coating Mill" (Rosetta Street). In 1948, the "Lower Mill" was shut down and the building was purchased by W. B. Ackerman Limited, makers of electrical appliances and steel office equipment. To-day it serves as a storehouse for De Havilland Aircraft of Malton, Ontario.

However, the "Coating Mill" is still in operation, -

indeed, it is the second largest employer in Georgetown. Approximately 235 are employed in the manufacture of a general line of coated book, coated Litho and special type papers. These products are marketed throughout Canada and exported.

The Georgetown Coated Paper Mills, started in 1910 by L. E. Fleck, are now owned by the Alliance Paper Mills Limited. During 1920, an addition was built to the east end of the mill to provide space for more modern coating and colouring equipment. Four additional coating machines were installed and the annual production of the mill was increased in 1921 to 4,500 tons (1911 annual production was 2,000 tons). In 1928, the company was re-organized and became a division of Alliance Paper Mills Limited.

To-day an extensive line of printing and specialty coated papers are manufactured. The annual capacity is 9,600 tons per year and employees total some 190. These papers are sold chiefly on the Canadian market, although from time to time export shipments are made to some of the Commonwealth and South and Central American countries. However, coated papers are mainly distributed through wholesale paper merchants across Canada, and are sold by them to the printing and lithographing trades.

The Dominion Seed House was established in 1928 by W. Bradley and to-day it is one of the largest mail order seed houses in the country. Over one thousand various types of seeds are handled by this firm, many of them rare and

uncommon varieties. The Dominion Seed House propagates very few of its own seeds on the 75 acre farm that it occupies within the town boundaries. Rather it imports seeds from all over the world to be retailed to Canadian gardeners. The need for labour fluctuates seasonally with a maximum of 80 to 100 being employed from the middle of January to the end of April.

Mushrooms are grown by the Meadowglen Growers in their plant north of Smith and Stone Limited. It was established in 1940 and employs approximately 17 men. This firm has an annual production of 290,000 pounds, one half of which is purchased by various canning firms. The remaining one half is placed on the open market in Southern Ontario.

The Dolphin-Craft Company Limited occupies the old Dayfoot Shoe plant on John Street and the old Georgetown Clay Products building on King Street near Elgin. This firm manufactures Fiberglas boats and employs approximately 20 men.

Other industries are the Harley, Kay, Marsland Machine Company Limited, W. Lavoie and Sons Limited (Knitting), Georgetown Lumber Company, J. B. Mackenzie and Son (Lumber and Builders' supplies), the Credit Valley Bottling Works, and Cordero Candies.

From this description of the industries of Georgetown, it is fairly evident that manufactured goods of low bulk but high value are produced. Such industries are now tending to locate away from the heavy industrial centres

such as Hamilton simply because existing transportation facilities and hydro-electric power allows this dispersal. Industries of this type provide the necessary diversification to ensure relative prosperity even in depressional times. It is my belief, that in the future, similar industries will tend to locate in centres such as Georgetown rather than in Hamilton or Toronto.

Miscellaneous

Georgetown has eight church buildings, six of which are in operation. The Anglicans, Baptists, Presbyterians, Roman Catholics, United Church and Zion Tabernacle are all represented. The Congregationalist Church on Church Street is presently occupied by the Georgetown Public Library. The other church at the head of Wesleyan Street is vacant at this time.

Georgetown has three schools; two secondary and one public. The high schools derive many of their pupils from the rural areas of Esquosing Township while the public school students generally reside in Georgetown. The United Church of Canada operates the Cedarvale School for Girls in which orphaned, unwanted and delinquent girls are trained.

The town has an excellent source of cheap water for domestic purposes. Although located on a branch of the Credit River, Georgetown has used springs since the early 1890's.

Until 1948, the only source of water was these surface springs which drained into a reservoir three miles

outside of the town. This reservoir drained into another on Main Street over which the municipal buildings have been recently erected. No pumping system was necessary as the 190 foot difference in elevation allowed a gravitational flow of water.

In 1949, the springs appeared to be drying up and deteriorating in quality. Then a spring was discovered which is being used to-day and is said to have a daily capacity of one million gallons of water which needs no filtration or chlorination of any kind. Water is removed from this source and transmitted to the domestic supply lines by an electric pump.

The recreation facilities of Georgetown are well developed. The fairgrounds which are located west of Charles Street have three ball diamonds, one band stand, a grandstand which will seat approximately 200, a race track and an armoury. There is a bowling green at the corner of William and Edith Streets and an arena on John Street. The commercial core has the usual theatre, bowling alleys and billiard rooms.

Georgetown has recently annexed a large section of Esquesing Township. This expansion is a result of a planned future as the land which has been annexed will provide excellent residential and industrial sites. By the proposed plan no more than 40 per cent of the annexed area will become industrial or commercial in function while the remaining 60 per cent must be residential.

This annexation has more than doubled the areal extent of Georgetown. It stretches from the old town boundaries (see figure 13) covering 1,728 acres almost to Norval taking in land on both sides of the highway. The land to the north of Highway No. 7 is slated to become the industrial part of the subdivision as spur lines from the Stratford-Toronto line may be easily constructed. The southern portion of the properties annexed will be mainly residential with some light industry along the highway frontage. A business section may also be built along the highway.

(B) AN URBAN STUDY OF ACTON

General Introduction

Acton is located at the junction of No. 25 and No. 7 Highways and is served by the Canadian National Railways and Gray Coach bus service. The town enjoys a geographical location similar to that of Georgetown with respect to the proximity to the greatest concentration of people in Canada. Acton was incorporated as a village in 1873 and became a town in 1950. The population according to the 1951 census stands at 2,880.

Physical Setting and Street Pattern

Acton, like Georgetown, is located on a post-glacial spillway. However stream dissection has not affected the same degree of surface configuration as in the

case of Georgetown. Pleistocene deposits are shallower than those in the vicinity of Georgetown.

The physical site has strongly influenced the direction of Acton's growth. Before Fairy Lake was formed by the construction of a dam, a stream of considerable size flowed around the western edge of Acton and continued in an easterly direction over the edge of the escarpment. As a result, much of the sand and gravel deposited in the spillway was removed and the stream bottom was eroded down to the underlying Lockport formation (see figure 6).

To-day, three fairly substantial barriers to urban growth exist; the swampy land to the south-west, Fairy Lake to the west, and the eroded valley to the east. The roughness of terrain has limited urban development on the west side of Fairy Lake.

The valley to the east of Acton presents definite problems to the construction of sewers, water mains and basements simply because of the shallow overburden which covers the unyielding Lockport formation. The route taken by the Toronto-Stratford line of the Canadian National Railways was determined by this valley. As previously stated, this valley provided the only break in the Niagara Escarpment for several miles on either side. As a result, the Grand Trunk Railway was constructed through this gap.

The street pattern of Acton has consequently developed on Class III land. This land type is admirably suited for urban growth because of the excellent internal

drainage, the comparatively low relief and its disadvantages for agricultural utilization. As a result, a distinctive grid pattern of streets has developed; topography and the railway present a few inconsistencies.

Since the railway cuts diagonally across the grid pattern of the streets it naturally influences their layout. Young Street and Guelph Street North have been particularly influenced since they were forced to parallel the railway. Crescent Street and Guelph Street South follow along the upper edge of the valley, and naturally bend in a more easterly direction in order to parallel that taken by the railway. Urban growth has been limited southwards and westwards by the existence of Fairview Cometary and swampy areas. Mill Street West has been forced to curve southwards by Fairy Lake, in order to join the town to the First Line.

Components of the Functional Plan

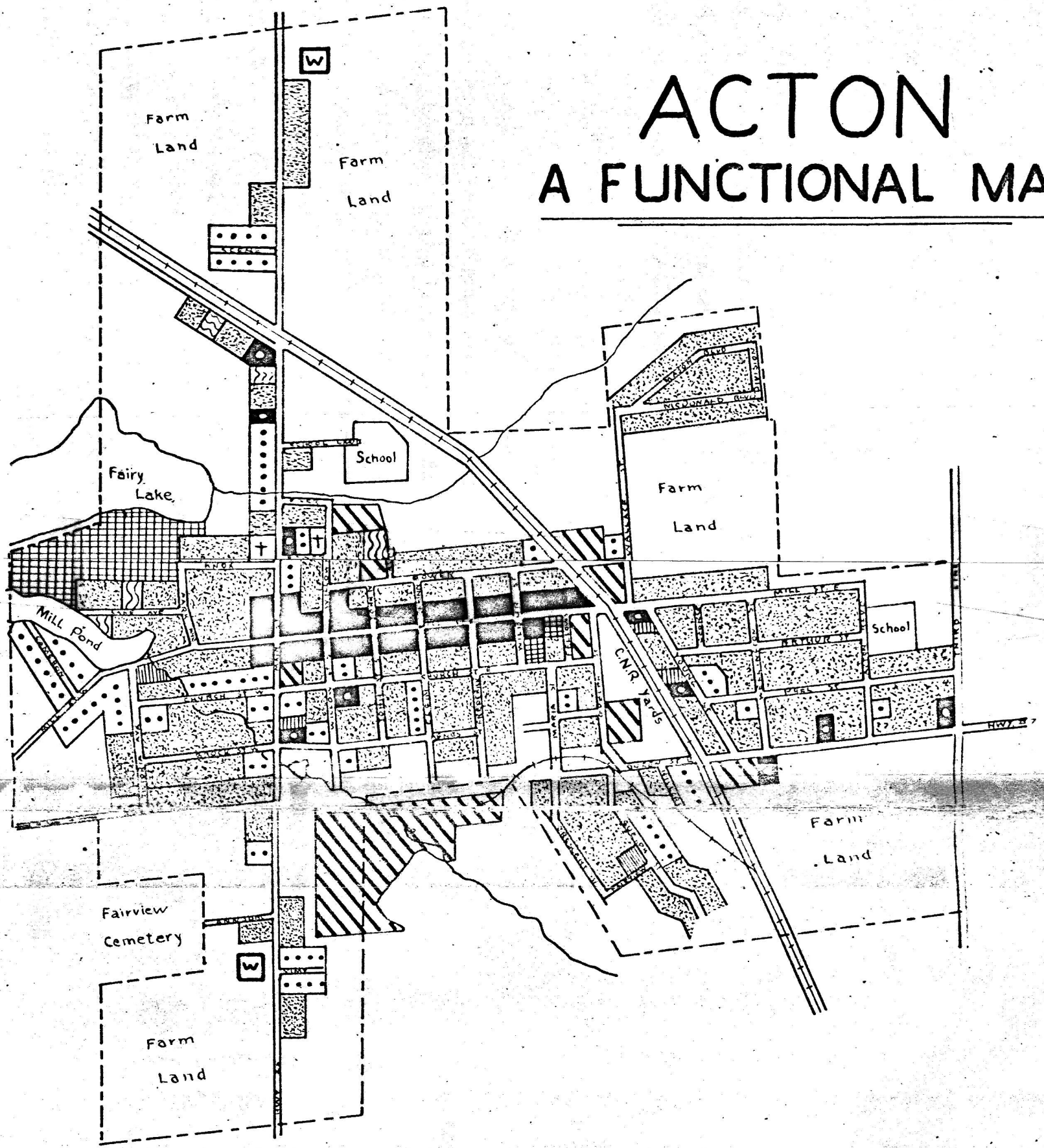
Commercial Core

This area is definitely linear in shape as opposed to the nucleated shape of the commercial core of Georgetown. This shape may be explained by a single "main" street (Mill Street) on which the greatest concentration of commercial establishments occur. The reason for this may be that the original commercial enterprises were established here. Naturally, they attracted subsequent stores which were built along the main street.

The area delineated on the functional map

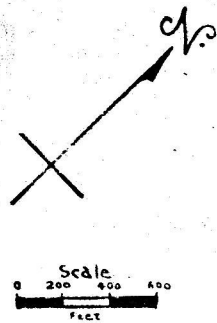
ACTON

A FUNCTIONAL MAP



LEGEND

- Residential**
- (a) First Class
 - (b) Second Class
 - (c) Third Class
 - Industrial
 - Recreation
 - Church
 - Water Supply



- Commercial**
- (a) Core
 - (b) Service
 - (c) Retail
 - Idle
 - Railway
 - Street
 - Town Boundary

(see figure 12) is somewhat misleading as to the relative importance of different sections of this solid black area. The maximum density of stores occurs extending from Main Street (Highway No. 25) to John Street. In these two blocks there are over forty-five separate commercial establishments, while from John Street to Guilph Street there are only fourteen establishments devoted to commercial activities. However, simply because it is the commercial function that is most dominant in the entire area, I felt justified in including both sections into one. Residential establishments do occur but are relatively few in number.

Outlying Service Centres

For the most part, service centres not included in the commercial core, are gas and service stations. The plumbing service on Main Street just north of the school lane and the laundry at the corner of Church and Willow Streets are the only two exceptions.

Since these service stations tend to cater to the motor vehicle trade, they naturally locate along the main streets and highways. From this, their distribution may be plotted, as might be expected, along Queen Street (Highway No. 7), Younge Street, Mill Street (some are included in the commercial core) and Main Street (Highway No. 25). This is the route followed by most motor vehicles travelling through Acton.

Outlying Retail Centres

Because of the compactness of the street pattern and consequent proximity of the inhabitants to the commercial core, there is very little need for many outlying grocery stores. Only three grocery stores are not grouped into this core simply because of their position within the town plan. Two occur along Young Street and cater mainly to the comparatively new section contained between Queen and Mill Streets and the Third Line and Young Street. The store found at the corner of Crescent and Guelph Streets serves only the immediate area.

The only two other delineations of retail establishments are not grocery stores. The feed dealer at the corner of Mill and Victoria Streets caters to the surrounding rural population of Esquesing Township while the real estate office on Main Street handles the sale of much of the property in and around Acton.

Residential

(1) First Class Homes - In only five instances were homes found that could justifiably be classified as first class. The two examples found on Lake Avenue are large old homes that have been remarkably well kept. The other three examples are those found on Main Street North and on Alice Street and are homes of fairly recent construction and high value.

The reason for the dearth of first class homes is obscure. Acton has not benefited from the same degree of

industrial diversification that has marked the growth of Georgetown. The Beardmore Tannery has dominated the occupational opportunities for so long that the profits have been concentrated in the hands of a few non-resident shareholders. The majority of the employees of this firm reside in Acton and receive an income that has remained comparatively constant regardless of the profits made. This may account, in part, for the large number of middle class and the existence of only a few first class homes.

(ii) Second Class Homes - Both old and new residences are found in this classification, often in equal proportions. The reason for the predominance of middle class homes is closely related to the individual income of each family. Since by far the greater proportion of wage earners are employed as semi-skilled labourers in a well established industry, it naturally follows that their income will remain comparatively constant. As a result, large numbers of second class residences occur in Acton.

(iii) Third Class Homes - Almost without exception, the poorest class of homes tend to be the oldest. For the most part, they are homes that have been built as second class homes but through inefficient maintenance, have been allowed to deteriorate.

It is of interest to note that they tend to occur in groups. The presence of one third class home lowers the value of those adjacent to it. This allows a lower income group to move in and soon all homes in the area

tend to be allowed to deteriorate. Examples of this may be found on Main Street North, Church Street West, Guelph Street and Hillcrest.

The groups of third class homes found on Vimy Street, Cameron Avenue and Scene Street probably never have attained second class standards and have been built on the periphery of the urban plan on low cost land. Those on Cameron Avenue are built on poorly drained land while those on Vimy Street are continually subjected to the nauseous vapours that emit from Beardmore Tannery.

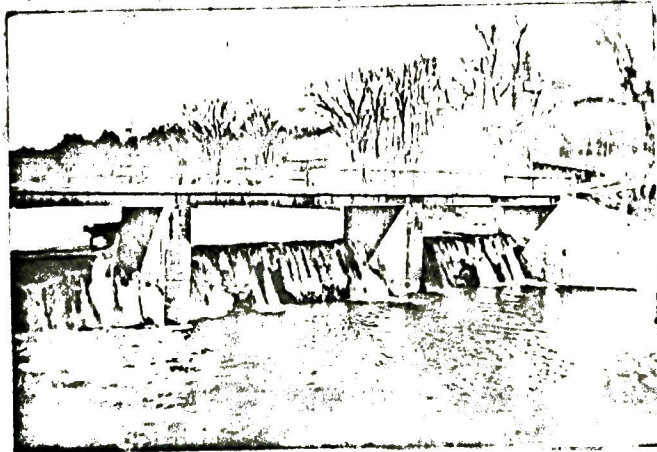
Industry

Generally, the industries of Acton tend to locate adjacent to the railway line. Consequently there is a definite concentration of industrial establishments in the vicinity of Guelph and Wallace Streets. Originally, these industries were built on the periphery of the urban plan, but to-day with the expansion of the town in a north-east direction, they are generally found in the midst of the residential area. For the most part however, these industries are not obnoxious to the near-by home owners.

Beardmore Tannery is the one main exception as the odours that are emitted by this plant are, at times, very offensive. This industry has located on the stream that runs through the southern section of town simply because of the large demand for water to be utilized in the tanning process by the original industry established by A. Nellis. A spur line of the Canadian National Railways has been



**Photo No. 25. View of the Beardmore
Leather Company as seen from the top of
the Acton Water Tower.**



**Photo No. 26. The Credit River dammed
at Georgetown. Note how the steep
valley sides have facilitated the
construction of the dam.**

built into the plant property to provide the necessary transportation facilities for the import of raw materials and the export of the manufactured product.

Until 1922, Beardmore also owned and operated a tannery near Bracebridge, adjacent to a large supply of hemlock bark. Due to changing tanning methods and a desire to consolidate its activities, this plant ceased operations and the firm concentrated its activities in Acton in 1922. In this year there were three tanning firms in Acton; The Acton Tanning Company Limited, the Muskoka Leather Company Limited, and the Beardmore Belting Company. They were later amalgamated under Beardmore Tanning Company.

To-day, this industry is a subsidiary of Canada Packers and the largest tannery in the Dominion of Canada. Property utilized covers 500 acres and the plant itself employs 400 to 500 workers. Over one million sides of leather, many of them shipped from the slaughter houses of Canada Packers, are processed a year. Beardmore Tanning Company has been the main employer of the residents of Acton, and the growth and prosperity of the town have been closely linked with this industry.

The Storey Glove Company which was established in 1840 was closed down in December, 1953. In February of 1955 the S. G. Smallwood Limited of Kitchener took over the four storey brick building at the corner of Alice and Bower Streets for the manufacture of radio and television components. This is an excellent example of the increased modern tendency to

establish industries producing high value but low bulk articles in the smaller towns, dispersed from the larger, heavy industrial cities. To-day, transportation facilities and hydro-electric power are so well developed that such industrial dispersal is possible.

A similar industry is the Force Electric Company which operates in the factory on Guelph Street near Queen Street East. In 1940 this firm replaced a shoe factory which had been established in 1918. Fifty people are employed in the manufacture of electrical appliances.

The Micro Plastics Company Limited produce all types of plastic products. It is the largest producer of plastic pipe in Canada and employs over 50 workers. This firm was established in 1942 and has built two additions; one in 1950 and another in 1953. During 1954 Micro Plastics purchased 14 additional acres in order to allow for future expansion.

The Baxter Laboratories of Canada have a representative in Acton which employs approximately 150 people in the plant on William Street North near River Street. This firm was established in 1942 and produces hospital supplies and large quantities of distilled water.

The plant now occupied by the Baxter Laboratories was built in 1920 by the Mason Knitting Company. In 1942 this firm moved to its present location at the corner of Guelph and Church Streets. Seventy-five are employed here in the manufacture of children's underwear.

The Blow Press Company Limited originated in 1910 under the name of "Acton Machine Shops". In 1920 a factory was erected on Bower Street East, adjacent to the railway line. This firm employs 20 workers in the manufacture of punch presses.

Neighbouring the Blow Press Company Limited is the A. P. Green Fire Brick Company Limited. This firm was established in 1950 and to-day employs 30 individuals in the production of crucibles.

The Wool Combing Corporation purchased a building from the Beardmore Leather Company to house their equipment in 1941. One hundred and fifty individuals are employed in the processing of raw wool into material to be utilized by spinning mills.

The last industry of any significance to be described is the Ajax Engineers Limited. It was established in 1928 by the Criber Brothers for the production of monuments. In 1935, the firm was taken over by Ajax Engineers Limited who manufactured wooden tanks, steel structures and cooling towers. To-day, radio and television towers are also built. In 1936, this firm became the Canadian representative for the Marley Company of Kansas City and on December 31st, 1954 was purchased by this firm. The company now employs 25 individuals and a future programme of expansion is under consideration.

From the foregoing description of industry, one may clearly see by comparing the number employed how the

Beardmore Leather Company provides the main single source of employment. However the importance of this industry to the inhabitants of Acton is declining as there has been a recent tendency for workers to commute from centres outside of Acton, some as far away as Guelph. Meanwhile, the younger generation of Actonians tend to seek employment in the more recently established, growing industries.

Also, it is evident that the main type of goods produced are those of high value but low bulk. Baxter Laboratories, S. G. Smallwood Limited, Force Electric, Micro Plastics, Elow Press, Ajax Engineering and A. P. Green Fire Brick, all fit into this category. It is my belief that this industrial diversification and dispersal will continue in the future. Given proper guidance, Acton could develop industry to provide a constantly increasing source of employment.

The Beardmore Leather Company and the Wool Combing Corporation are more primary in nature than the other industries of Acton. They process the raw material to a stage where it may be exported to and utilized by another firm. The transportation facilities are of primary importance to these two industries to the extent that a spur line of the Canadian National Railways has been constructed to serve them. Future industrial development could be directed to attracting new plants which could utilize the products manufactured by these two firms. In this way, transportation costs would be reduced.

Miscellaneous

Acton has five churches, all of which are active to-day. Anglicans, Baptists, Roman Catholics and United Church groups are all represented. There are three schools - two secondary and one public. An ample water supply is obtained from a well on the second line near the municipal boundaries. From here it is pumped to the water tower across from Vimy Street from which it flows by gravity to serve the town.

Acton is well served by recreation facilities. A movie theatre, bowling alleys and a billiard room are all found within the commercial core. Acton is the smallest community in Canada to own and operate an establishment of the Y.M.C.A. There is an excellent lawn bowling green and tennis court in the block bounded by Mill, Church, Wilbur and Fellows Streets. The 11 acres of Prospect Park between Fairy Lake and the Mill Pond contains a race track, grand stand, ice arena, baseball diamond, wading pool, picnic tables and general playground facilities.

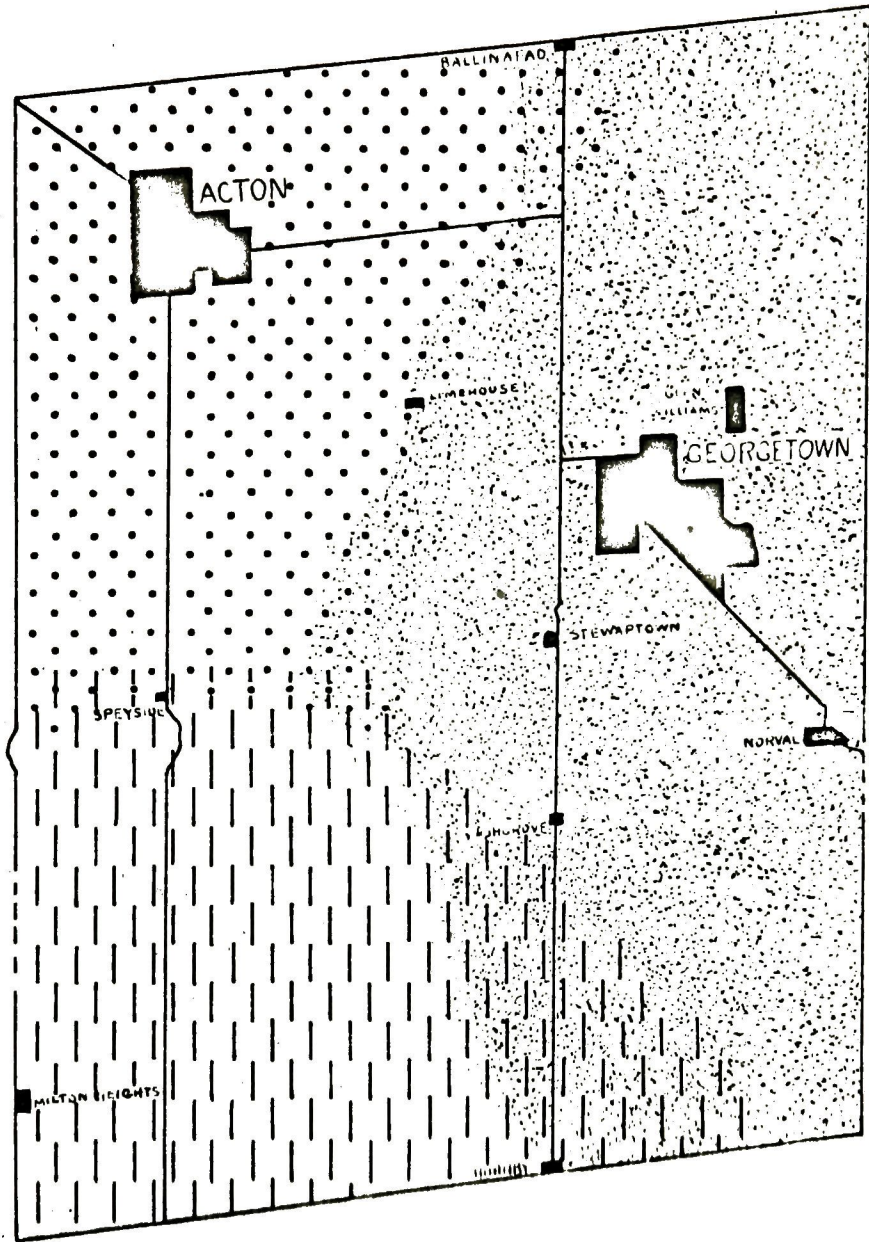
Since March 1st, 1965, Acton's boundaries have enclosed 979 acres instead of the 514 delineated in figure twelve. The larger part of Esquesing Township which was annexed is found to the south of the town. Consequently, the properties of Beardmore Leather Company and Wool Combing Corporation are now included in the town of Acton. This raises the assessment value of Acton by \$400,000 and is the culmination of a long fought battle between the authorities of Esquesing Township and the municipality of Acton.

Already four new residential sub-divisions have been laid out and the construction started, which, when finished, will add 300 more homes to Acton




(F) RETAIL SPHERES OF INFLUENCE AFFECTING ESQUESING TOWNSHIP

In order to determine the retail spheres of influence affecting Esquesing Township, the following method was used. In the first place bank managers were interviewed and questioned as to the areal extent served by their establishments. As Acton, Milton and Georgetown all have two or more banks, a fairly accurate delineation could be determined. Similarly all three towns have weekly newspapers and a check was provided from their circulation. The distribution of the rural routes of the three towns has also been taken into consideration as were interviews with several grocery store managers. Finally a check was made by interviewing the inhabitants of Esquesing Township who resided near the boundaries provided by the aforementioned criteria. The result, I believe, is a comparatively accurate picture of the retail trade areas within the township under study.

Before the influences of these three main towns are considered, the affects of Guelph and Toronto must be mentioned. The influence of Guelph tends to be present, but only to a small extent, in the vicinity of Acton. This, I believe, is due to the excellent transportation facilities



RETAIL SPHERES OF INFLUENCE
AFFECTING ESQUESING TWP.

-  MILTON
-  ACTON
-  GEORGETOWN

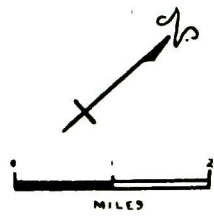


FIGURE 15.

provided by Highway No. 7. The influence of Toronto is sporadic throughout the entire township but only to a minor degree at any time. Occasionally, the people do shop in Toronto, but such occasions (e.g. Christmas) are few.

In the cartographic presentation of these spheres of influence, I have purposely neglected to draught a definite line of delineation. For the most part, the boundaries are transitional but even the degree of transition varies from place to place. Often the inhabitants of a certain location tend to shop in one centre, while their neighbours shop in another. On the other hand, the inhabitants of these transitional areas often shop in two or more towns with equal regularity.

Georgetown

Georgetown exerts an influence over almost one-half of Esquosing Township. This may be directly related to its central location in the northern half of the township and the excellent system of communications that converge on this town. The Canadian National Railways and Highway No. 7 permit consumer goods to be economically imported into Georgetown from Guelph, Hamilton and Toronto. On the other hand, the radiating system of roads provides the necessary facilities for the distribution of these goods within the township.

Norval is generally conceded to be the terminus of Georgetown's eastern extent. Beyond this village, the presence of Highway No. 7 allows the larger centre of

Brampton to take over.

Glen Williams and Stewartown are naturally controlled commercially by Georgetown. This may be explained by their proximity, transportation facilities and the fact that to-day their main function is to act as suburban residential villages for Georgetown.

Ballinafad and Limehouse are equally shared by Acton and Georgetown. Both of these small settlements have one or two general stores which serve the day to day needs of the inhabitants of their immediate hinterland.

The influence of Georgetown tends to weaken around Ashgrove but it is still stronger than that of Milton. This may be attributed to the proximity of Ashgrove to Georgetown and the existence of a paved road (Seventh Line) that links them together.

Acton

Because this town is situated in the western corner of Esquesing Township, the section influenced by its retail function is comparatively small. However, because of this geographical location, combined with the facilities provided by the road network, the sphere of Acton's influence extends to a greater distance into neighbouring townships than that of Georgetown.

Acton is served only by one railway line and, as a result, has no direct rail connection with Hamilton. However, since the vast majority of imported consumer goods may be economically transported from Toronto, this does not

Present a problem.

Highway No. 25 allows Acton's retail trade to extend to the edge of the escarpment, but I can see no reason to attribute this fact directly to the presence of this physiographic division.

Milton

Although this town is not found within the boundaries of Esqueasing Township, the influence of its retail establishments is felt over an area somewhat larger than that of Acton. The proximity of this town to Esqueasing Township, the fact that it is the county seat, and the transportation facilities provided by Highway No. 25, and the Trafalgar-Esqueasing town line all aid in the extension of Milton's retail trade into Esqueasing Township.

Milton is also served by two railway lines and, with the means provided by modern transportation facilities, it naturally has developed into a centre of commercial significance.

By way of summary, it is clearly seen that the three towns of Acton, Georgetown and Milton control the retail trade of Esqueasing Township. Since all are approximately of the same importance commercially, I would like to present their geographical positions and existing transportation facilities as being the main determinants in maintaining their individual spheres of influence. If, in the future, one of these towns greatly enlarged its commercial

function, a radical change in the present picture would result.

It is true that personal preference often results in a deviation from the "controlling" centre. Indeed, one may find consumers well within the sphere controlled by Georgetown, shopping in Milton. However, I believe, the delineations of retail trade areas found in figure 15 generally represent conditions as they now exist.

CHAPTER IV

SUMMARY AND CONCLUSION

(A) SUMMARY

Esquussing Township is located adjacent to the most densely populated section of the Dominion of Canada and is well served by excellent rail and road facilities. The Palaeozoic geology of the area is exposed along the edge and base of the Niagara Escarpment, which extends diagonally across the township and has given rise to extensive quarrying and brick production. The area under study has been subjected to the scouring and depositing action of the glaciers of Pleistocene times, a fact that accounts in part for the existing physiography and development of soils. The natural vegetation has largely been removed from the township and for the most part only the areas entirely unsuited to agriculture have been allowed to remain as woodlots.

Large areas of Class I land cover the township and provide excellent edaphic conditions to support an intensive agricultural programme. Climate also provides a suitable physical basis to support the agriculture that has developed.

The early settlers were almost all emigrants from the British Isles who, during the first few years of settlement, practiced a subsistence type of agriculture. Paralleling the rapid growth of population was the rapid clearing of the land and the tendency to concentrate on wheat as the main cash crop. With the opening of western Canada and the rapid rise in

urbanization, the concentration on the production of wheat gave way to mixed farming with emphasis on dairying.

Urban centres developed mainly around mill sites whose location in turn was determined by the presence of running water. Then with the construction of the Grand Trunk Railway and the adoption of steam driven machinery, industry was naturally attracted to Georgetown and Acton.

The decline in importance of the rural artisan, the improved methods in agriculture, and the attraction provided by Western Canada resulted in a surplus of rural population and subsequently, rural depopulation. Many emigrated from the township under study but many also augmented the growing population of Georgetown and Acton.

(B) CONCLUSION

Mixed farming with an emphasis on dairying dominates the agriculture of Esquesing Township. From this, the most important crops are hay and pasture. Other crops grown are mainly those utilized in the feeding of livestock.

The difference in elevation of land above and below the escarpment has had little or no affect in limiting the occurrence of crops in Esquesing Township. Rather, any difference in land use may be directly related to the soils which have developed from the Pleistocene deposits. For the most part, soils that occur above the escarpment have been formed on a limestone plain, till moraine and spillway while below the escarpment soils have developed from

inherently more fertile parent materials (with the exception of the Georgetown Spillway and Norval Sand Plain).

Consequently, a greater proportion of Class I land has developed immediately at the base of the escarpment than on the "upland" section.

However, it is of significance to note that wherever Class I land does occur above the escarpment, the acreages and yields for each crop are the same as on Class I on the "lowland" section. That is, the land use that has developed on a certain class of land is very similar whether it occurs above or below the escarpment. From this it may be clearly seen that edaphic, rather than climatic factors control local variations in land use.

The only evidence to conflict with this theory is the fact that commercial orchards occur on the land below the escarpment. Although fruit culture does not provide a significant source of the total income received from agriculture in Esquesing Township it is believed that the escarpment does provide some limited protection from the prevailing westerly winds. However, when the overall agricultural economy of the township is considered, the Niagara Escarpment has exerted a very limited affect in controlling the land use.

Milton, Acton and Georgetown are the main urban centres that affect the township under study. Although Milton is not located within the township boundaries, it does command a portion of its retail trade and has influenced

the development of certain sections in and around Milton Heights.

The growth of Acton has closely paralleled that of the Beardmore Leather Company. This firm has provided the main source of employment for the town while, at the same time, has limited the attractiveness of Acton to prospective industries. Although the town has recently annexed a large portion of the township there is no "master" plan by which industrial, commercial and residential development may be directed.

Georgetown, on the other hand, enjoys the relative prosperity that results from industrial diversification. The industries of Georgetown are more varied and, for the most part, larger than those of Acton. This town has also recently annexed a large portion of the township but the future expansion is being planned. Although there has been complete disregard by the planners for the encroachment of urban development on Class I land, the proposed plan and promised services will naturally attract industry.

with the completion of the St. Lawrence Seaway and Highway 401, these two urban centres should continue to expand commercially, residentially and industrially.

As stated in the introduction "an attempt will be made to delineate definite geographical regions within the township". However, after an interpretation of the land use map was completed no definite areal differentiation could be found. It is true that "regions" may be differentiated

but these are for the most part, landform regions, urban regions, etc. and do not satisfy my concept of geographic regionality. It is possible that the entire area enclosed by the political boundaries of Esquesing Township form an integral part of a larger geographical region. However this is a study not encompassed by this thesis.

Consequently, the foregoing chapters have presented a study of distributions and relationships while the attempt to delineate geographical regions has failed. With this in mind, I would like to present this thesis simply as a geographical appreciation of Esquesing Township. It is my sincere hope that it may promote a greater interest in geographical studies and may serve as a guide for future planning in the township.

APPENDIX ADepth of Glacial Drift over Palaeozoic Bedrock¹

<u>Location</u>	<u>Name</u>	<u>Feet</u>
Concession II Lot 15	W. Douglas	14
II 21	J. Steele	16
II 24	J. Soyers	10
II 26	K. Breen	4
II 30	Smith and Derby	62
III 26	J. Bruce	14
III 28	Town of Acton	32
IV 6	Taylor	65
IV 24	C. Foster	41 (not to bedrock)
V 20	C. France	108
VI 23	Dr. Crisp	3
VII 23	J. Rundle	8
VIII 7	M. McNabb	119 (not to bedrock)
VIII 21	E. Batkin	20
VIII 28	S. Bennett	6
X 10	G. Brown	74
X 15	L. Lyons	69 (not to bedrock)
X 16	R. Mendham	94 (not to bedrock)
X 21	Glen Williams School	28
Georgetown	Town of Georgetown	119
		145

..... 170
¹ Taken directly from: Bulletin 145 of the Ontario Dept. of
 Mines. Ground Water in Ontario 1948, 49, 50. A. K. Watt.
 - a description of materials through which wells were
 drilled in search of water.

APPENDIX BScientific Nomenclature of Vegetation

Aspen.....	<i>Populus tremuloides</i> Michx.
Balsam Poplar.....	<i>Populus balsamifera</i> L.
Masswood.....	<i>Tilia americana</i> L.
Beech.....	<i>Fagus grandifolia</i> Ehrh.
Black Ash.....	<i>Fraxinus nigra</i> Marsh.
Black Cherry.....	<i>Prunus serotina</i> Ehrh.
Dogwood scrub.....	<i>Cornus</i> L.
Hemlock.....	<i>Tsuga canadensis</i> L.
Ironwood.....	<i>Ostrya virginiana</i> Mill.
Paper Birch.....	<i>Betula papyrifera</i> Marsh.
Red Maple.....	<i>Acer rubrum</i> L.
Sugar Maple.....	<i>Acer saccharum</i> Marsh.
White Cedar.....	<i>Thuja occidentalis</i> L.
White Elm.....	<i>Ulmus americana</i> L.
White Pine.....	<i>Pinus Strobus</i> L.

APPENDIX C

Soil Profile Descriptions¹

Oneida Clay Loam²

- A₀ - Thin layer of partially decomposed leaves, twigs etc.
- A₁ - 0-5 inches clay loam; very dark greyish brown (10YR 3/2); fine granular structure; friable consistency; few stones; pH.
- A₂₁ - 5-12 inches clay loam; yellowish brown (10YR 5/4); weak platy structure; friable consistency; stonefree.
- A₂₂ - 12-15 inches clay loam; brownish yellow (10YR 6/6); weak platy structure; friable consistency; stonefree.
- B₂ - 15-29 inches clay; dark brown (10YR 4/3); Coarse blocky structure; hard consistency; few stones.
- C - Clay till; pale brown (10YR 6/3); prismatic structure; hard consistency; shaley; stony.

Noburn Loam

- A₀ - Thin layer of partially decomposed leaves, twigs etc.
- A₁ - 0-4 inches loam; very dark greyish brown (10YR 3/2); fine granular structure; friable consistency; few stones.
- A₂₁ - 4-14 inches loam; yellowish brown (10YR 5/4); weak platy structure; friable consistency; few stones.

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¹ Profile descriptions were provided by the Department of Soils, O. A. C., Guelph. In all of the soils discussed the exact pH was not available. Due to the influence exerted by the shaly parent material, reaction tends to be more acidic than soils of Peel County (Soil Report #18).

² Oneida Silt Loam is also included in this description. There is only a minor difference in the texture of the A₂ horizon.

- A22 - 14-17 inches sandy loam; reddish yellow (7.5 YR 6/6); weak platy structure; very friable consistency; few stones.
- B2 - 17-25 inches clay loam; dark brown (7.5 YR 4/4); coarse nuciform structure; hard consistency; few stones.
- B3 - 25-37 inches clay loam; brown (10 YR 5/3); coarse nuciform structure; hard consistency; few stones.
- C - Loam till; brown (7.5 YR 5/4); Medium nuciform structure; hard consistency; stony; shaly.

Chingpaousy Clay Loam

- A0 - Thin layer of partially decomposed leaves, twigs etc.
- A1 - 0-6 inches clay loam; dark grey (10 YR 4/1); medium granular structure; friable consistency; few stones.
- A2 - 6-12 inches clay loam; yellowish brown (10 YR 5/4); mottled; weak platy structure; friable consistency; stone free.
- B2 - 12-24 inches clay; dark brown (10 YR 4/3); mottled; coarse blocky structure; hard consistency; few stones.
- C - Clay till; pale brown (10 YR 6/3); prismatic structure; hard consistency; shaly; few stones.

Box Sandy Loam

- A0 - Thin layer of partially decomposed leaves, twigs etc.
- A1 - 0-5 inches sandy loam; very dark greyish brown (10 YR 3/2); medium crumb structure; very friable consistency; stonefree.
- A21 - 5-22 inches sand; yellowish brown (10 YR 5/4); single grain structure; loose consistency; stonefree.
- A22 - 22-25 inches sand; pale brown (10 YR 6/3); single grain structure; loose consistency; stonefree.

- B₂ - 26-38 inches loam; dark brown (10 YR 4/3); medium nuciform structure; friable consistency; stonefree.
- C - Sand with occasional gravel strata; grey (10 YR 5/1); single grain structure; loose consistency.

Burford Loam

- A₀ - Thin layer of partially decomposed leaves, twigs etc.
- A₁ - 0-4 inches loam; very dark greyish brown (10 YR 3/2); fine granular structure; very friable consistency; few stones.
- A₂₁ - 4-18 inches sandy loam; yellowish brown (10 YR 5/8); weak platy structure; friable consistency; few stones.
- A₂₂ - 18-21 inches sandy loam; light yellowish brown (10 YR 6/4); weak platy structure; very friable consistency; stonefree.
- B₂ - 21-36 inches clay loam; dark brown (7.5 YR 4/4); coarse nuciform structure; firm consistency; stony.
- C - Well sorted gravel; brown (10YR 5/3); single grain structure; loose consistency; shaley

Dumfries Loam

- A₀ - Thin layer of partially decomposed leaves, twigs etc.
- A₁ - 0-3 inches loam; very dark brown (10 YR 2/3); fine crumb structure; friable consistency; frequent stones.
- A₂₁ - 3-12 inches loam; yellowish brown (10 YR 5/6); weak platy structure; friable consistency; few stones.
- A₂₂ - 12-17 inches loam; yellowish brown (10 YR 5/4); weak platy structure; friable consistency; few stones.
- B₁ - 17-22 inches loam; dark yellowish brown (10YR 4/4); medium nuciform structure; friable consistency; few to frequent stones.

- B₂ - 22-34 inches clay loam; dark brown (10YR 4/3); medium nuciform structure; hard consistency; very stony.
- C - Stony sandy loam till; pale brown (10YR 6/3); single grain structure; loose consistency; many stones and boulders.

Jeddo Loam

- A₀ - Thin layer of partially decomposed leaves, twigs etc.
- A₁ - 0-8 inches clay loam; very dark brown (10YR 2/2); medium granular structure; friable consistency; stonefree.
- G₁ - 8-16 inches clay; dark greyish brown (10YR 4/2); mottled; medium nuciform structure; plastic consistency; stonefree.
- G₂ - 16-37 inches clay; yellowish brown (10YR 5/4); mottled; coarse blocky structure; plastic consistency; stonefree.
- C - Clay till; pale brown (10YR 6/3); prismatic structure; plastic consistency; few stones and grit.

Lyons Loam

- A₀ - Thin layer of partially decomposed leaves, twigs etc.
- A₁ - 0-7 inches loam; very dark greyish brown (10YR 3/2); fine granular structure; friable consistency.
- G - 7-15 inches loam; greyish brown (10YR 5/2); mottled; medium nuciform structure; friable consistency; few stones.
- C - Brown (10YR 5/3); calcareous till; stony.

Warminster Loam

No profile description is available as there is less than a foot of soil over the bedrock. There is little differentiation in colour or texture within the weathered portion of the profile. The surface soil is usually a loam and a dark brown colour dominates the whole profile to the bedrock. Free carbonates are commonly found on the surface soil.

Bottomland

Similarly, bottomland shows little horizon differentiation. It is an immature soil whose profile usually consists of a deep dark coloured surface underlain by greyish material.

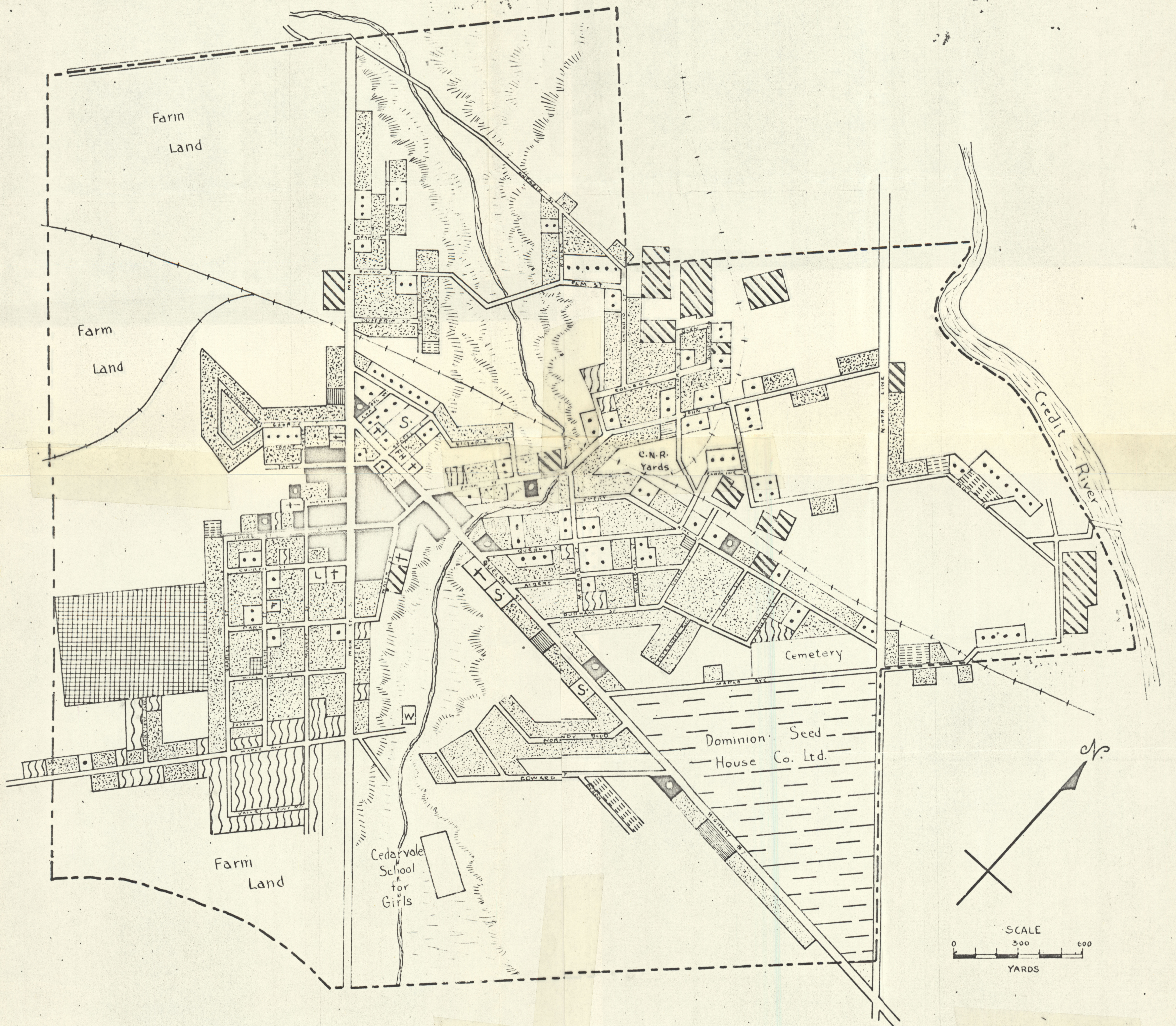
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 Toronto Telegram
 Brampton Conservator



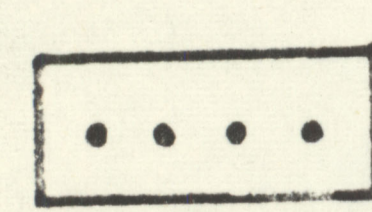
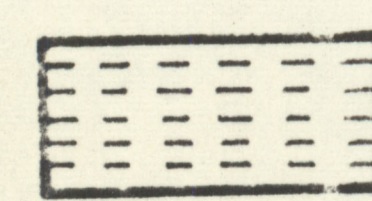
GEORGETOWN

A FUNCTIONAL MAP



LEGEND

RESIDENTIAL

-  First Class
-  Second Class
-  Third Class
-  Under Construction

RECREATION

INDUSTRY

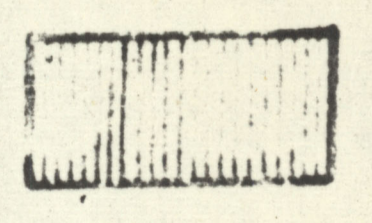
RIVER

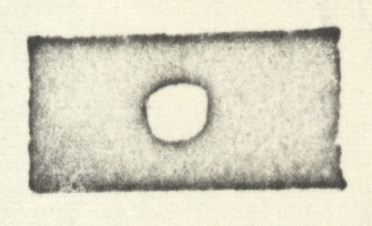
STREET

RAILWAY

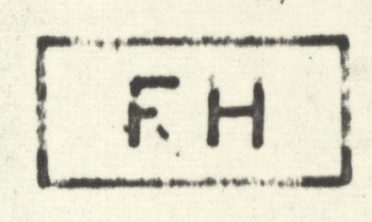
COMMERCIAL

Core 

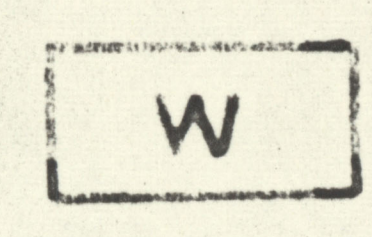
Retail 

Service 

CHURCH 

FIRE HALL 

LIBRARY 

WATER SUPPLY 

SCHOOL 

FUNERAL HOME 