

THE TOWNSHIP OF PUSLINCH

a geographical enquiry

by

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A thesis

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in partial fulfilment of the Requirements

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PREFACE

Many people, in the course of my investigations, have asked how I came to be studying Puslinch. In the spring and summer of 1959, I was part of an engineering survey crew concerned with the construction of Highway No. 401 through the township. Puslinch had an atmosphere of being left-over from the past. I returned many times after our work was finished, for I was intrigued by the stone ruins of once-fine homes and huge barns, and by the many examples of horse-drawn vehicles rusting and rotting at crossroads and on abandoned farms; I wished too, to be exhilarated again by the wild, yet quiet, majesty of windswept pines high on a bouldery ridge.

So when I came to write a thesis, Puslinch was my logical choice.

The work is divided into Books and Chapters. A writer in 1742 (Henry Fielding) stated:

...common readers imagine, that by this art of dividing, we mean only to swell our works to a much larger bulk than they would otherwise be extended to....

But in reality the case is otherwise, and in this, as well as all other instances, we consult to the advantage of our readers, not our own; and indeed, many notable uses arise to him from this method; for, first, those little spaces between our chapters may be looked upon as an inn or resting-place where he may stop and take a glass, or any other refreshment, as it pleases him....As to those vacant pages, which are placed between our books, they are to be regarded as those stages, where in long journeys, the traveller stays some time to repose himself, and consider of what he hath seen in the parts he hath already passed through....

In a work of geography, the chapters serve a further purpose: between them one can insert the necessary maps and photos, so that they may be close at hand, but without disturbing the reader's train of thought. Then too, it becomes an author generally to divide his work, "as it does a butcher to joint his meat, for such assistance is of great help to both the reader and the carver".

Here I should like to acknowledge generous help from many sources. Sincere thanks are given:

to the staff of the Department of Geography at McMaster University, especially to Mr. D. C. Ford, my adviser, who gave fully of friendly advice, encouragement, and knowledge;

to all the residents of Puslinch who answered questions, loaned material, and chatted amiably;

to the various Ontario Government departments and institutions who made material available, especially to Mr. P. F. Karrow of Dept. of Mines, and Mr. D. W. Hoffman of Ontario Agricultural College;

to my typist, Mrs. M. M. Leitch, who did an extremely careful piece of work;

and to my parents, who encouraged me, and withstood the storm of final collation.

McMaster University,
Hamilton, Ontario,
February 15, 1963

C. G. H.

CANADA

MICROFILMED
QND

INTRODUCTION

MADE IN CANADA

Introduction

The Township of Puslinch, with an area of $96\frac{1}{2}$ square miles, is the southernmost township of the County of Wellington (see Map, p. 3).

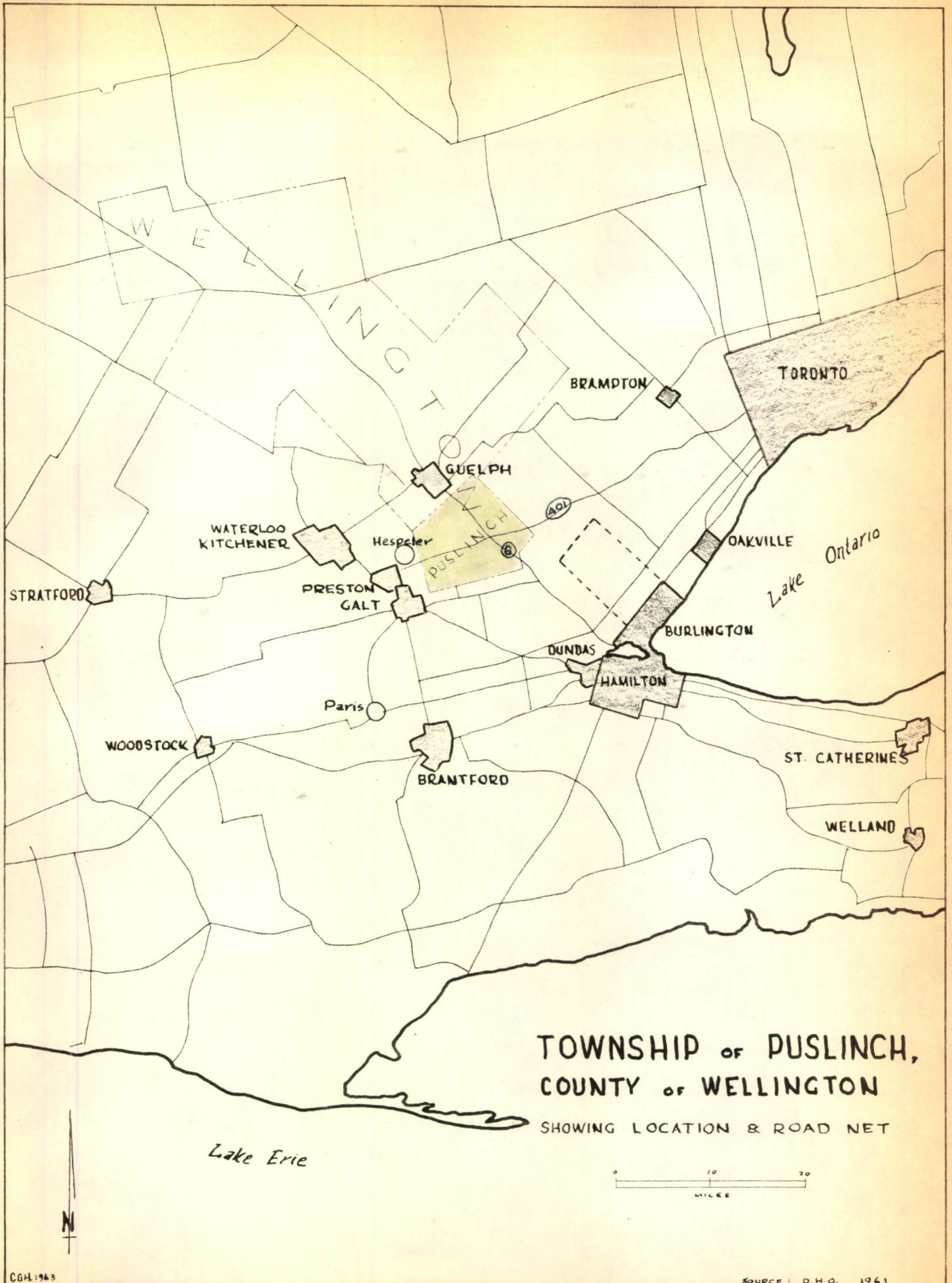
On its northern border is the City of Guelph (39,838); just to the west are Hespeler (4,519), Galt-Preston (37,211), and Kitchener-Waterloo (154,864). Only twenty miles to the south-east is the head-of-the-lake agglomeration of Hamilton, Burlington and Dundas (393,189); and only forty miles to the east is Toronto (1,618,787). But the largest centre in Puslinch is Morriston, with only 203 inhabitants.

Two of the main highways of Southern Ontario intersect within the township. Highway No. 6 joins Hamilton to Guelph and runs north to Bruce Peninsula; Highway No. 401 is a newly-completed controlled-access motorway -- the main through route of the province's core -- and crosses the township from east to west. By Highway No. 6, Puslinch is thirty minutes from Hamilton; by Highway No. 401, it is a mere forty minutes from Toronto.

The impression of the township varies according to the viewpoint. Journeying north along Highway No. 6, it looks fairly prosperous and well-used. In the south are rolling fields of grains and hay, well-painted barns, and herds of black and white holsteins. In the north, the township appears to be given over to suburban developments; old stone farm houses are interspersed with modern ranch type homes.

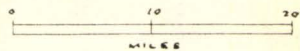
But if the township is seen from Highway No. 401, a very different impression is gained. Approaching from the east, this highway slices rock and forest; this soon gives way to rolling hills of natural grasses and maple woods, though here and there a prosperous farm breaks the scene. Soon it dips onto a broad plain; forests stretch along the horizon, and then move up to swallow the highway in a Northern atmosphere; a doe and fawn may leap the asphalt. As straight and as fast as an arrow, the highway lifts out of the swamps and into the hills to cleave again the maple forest. From Highway No. 401, Puslinch seems strangely remote and uninhabited.

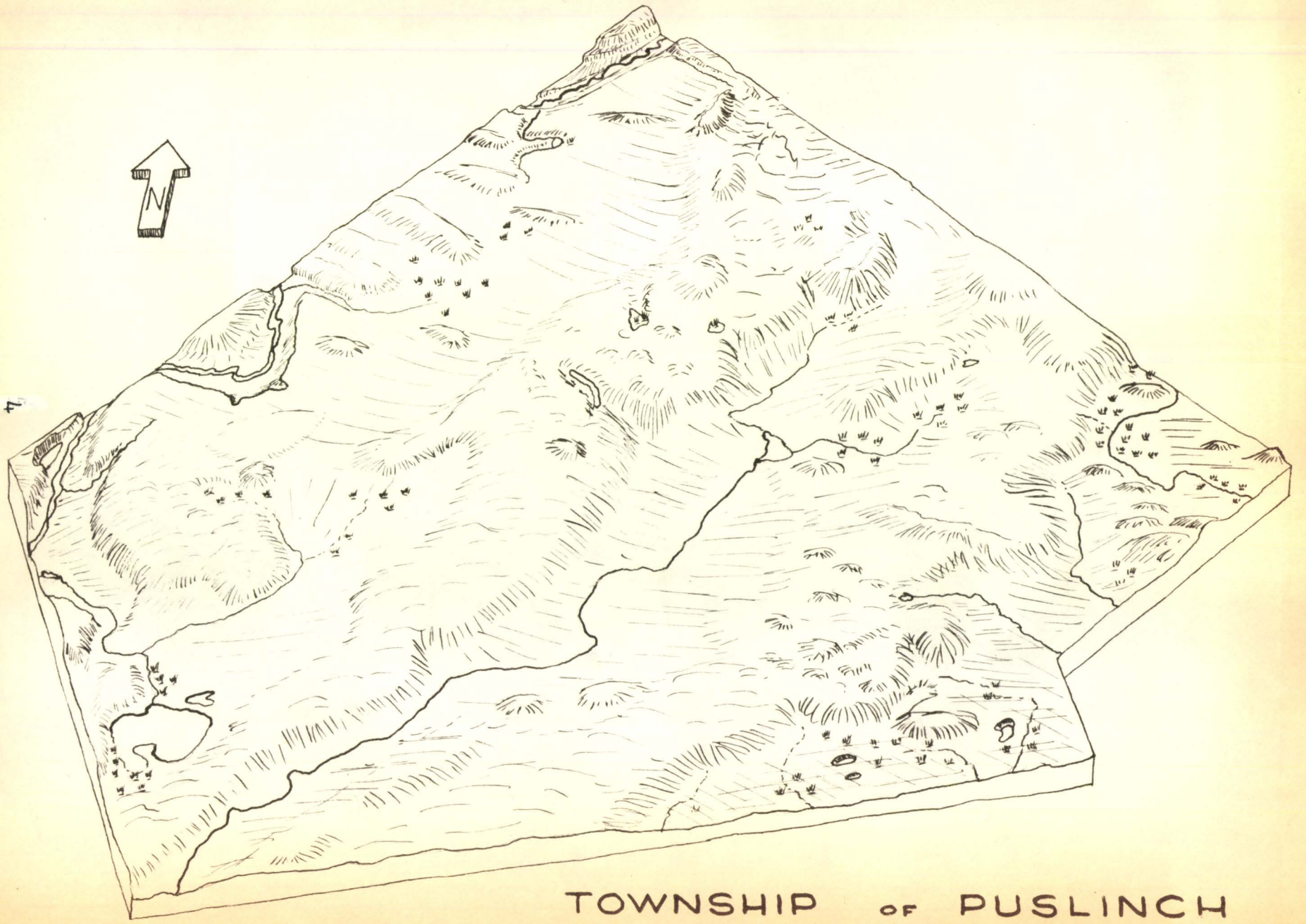
But the views from Highway No. 6 and from Highway No. 401 are both extreme. The township has rough grazing land, fine pastures, fields of grain, forests of cedar and of maple, and urban development. This confusing array cannot be understood without close study. It is the task of the following dissertation to probe Puslinch and to deliver its essence to the reader.



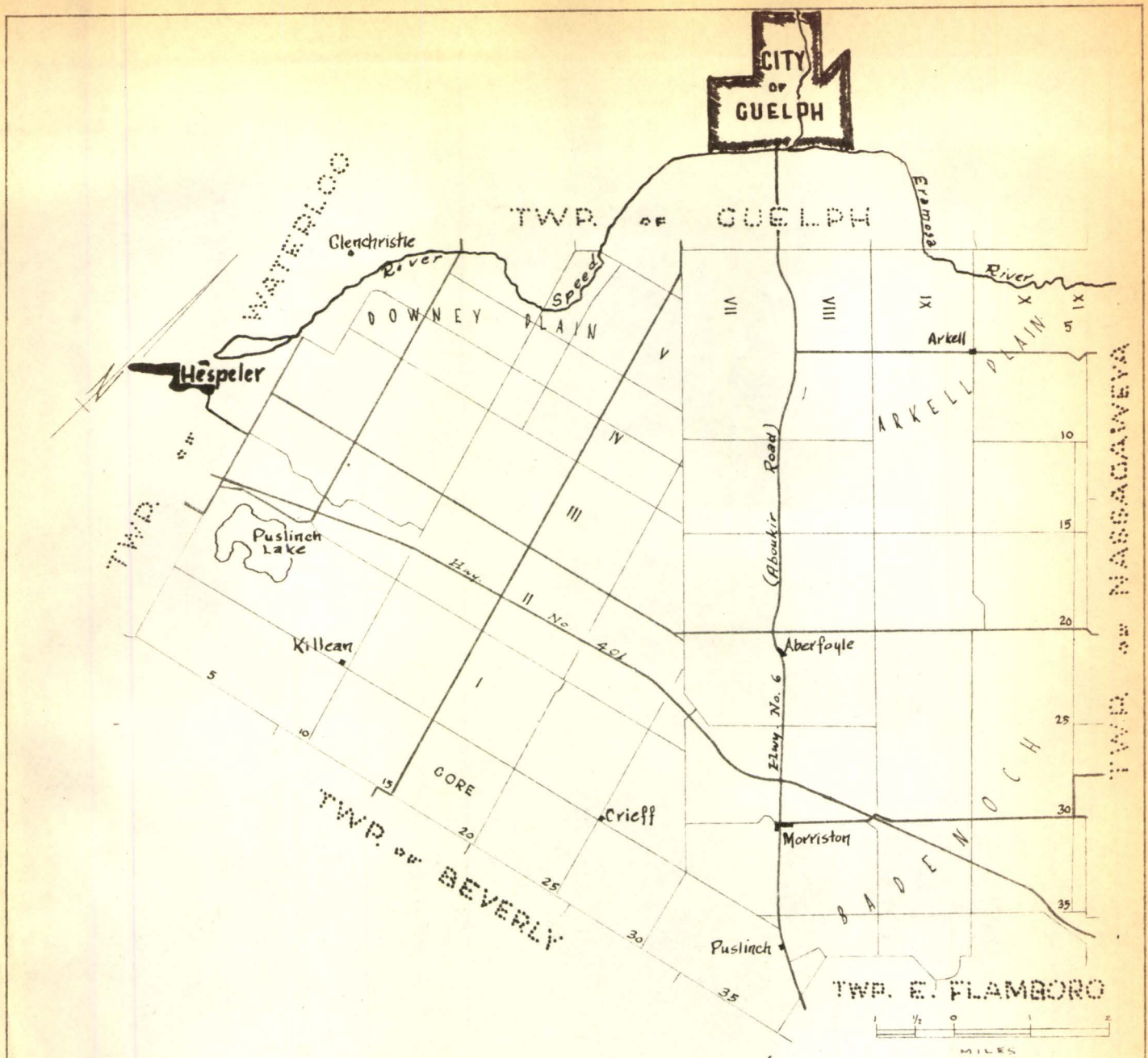
**TOWNSHIP of PUSLINCH,
COUNTY of WELLINGTON**

SHOWING LOCATION & ROAD NET





TOWNSHIP OF PUSLINCH



TOWNSHIP OF PUSLINCH
ORIENTATION MAP

BOOK ONE : LAND

1. Bedrock

The Guelph and Lockport dolomite formations of the late Silurian underlie the Township of Puslinch; in some areas they are found only at considerable depth, while in other areas they are close to the surface. But the places in which bedrock actually forms the surface, or is extremely thinly mantled, are peripheral, and small.

Near the township's northern corner, the Eramosa River, flowing in a fossil spillway channel, cascades gently over the flat and very thin beds of the Eramosa member of the Lockport formation. This is a dark, dense, dolomite.

At Glenchristie, in the western corner of the township, the River Speed also flows in a fossil spillway channel, cut through the Guelph and into the Lockport formation. The incision provided initially dry quarrying for a large lime concern, which is utilizing the dolomite of the Guelph formation.

Along the southern borders of Puslinch, bedrock is again exposed at the surface, and here has most interfered with settlement. Areas of shallow soil lie baked and hard in the summer sun, while scrubby swamps lie adjacent. The eastern half of the Gore Concession has two quarries into this dolomite; these were utilized for lime and crushed stone until the third decade of this century. Glacial striae can be observed here, trending North 50 deg. West.

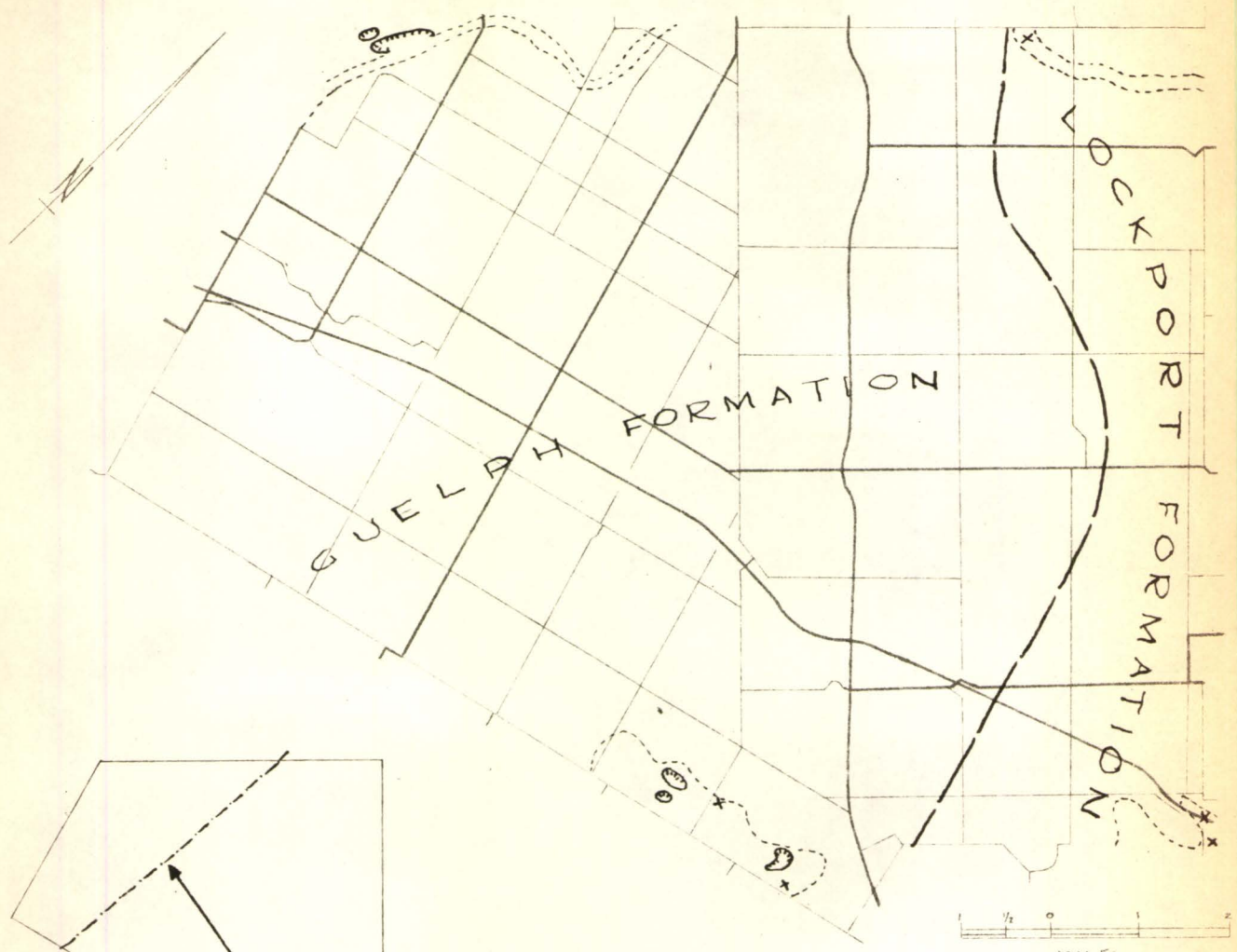
Finally, the Lockport formation can be seen in inter-drumlin

areas in the eastern parts of the township. Here it is folded into shallow anticlines trending slightly west of north. The anticlines have directed the headwaters of the Twelve-Mile Creek, and being at right angles to the line of flow of the Wisconsin ice, could account for the large plucked blocks of dolomite which now strew the surface in this locality.

The above exposures, along with water-well logs, indicate a level to slightly rolling bedrock topography with a regional dip to the southwest of approximately ten feet per mile. An exception has been revealed however, through the western part of the township. Several well logs, and the valley of the River Speed near Guelph indicate the presence of a buried river valley.¹ Along the south bank of the Eramosa River, about one mile east of the confluence with the River Speed, bedrock banks give way, for a short distance, to glacial debris; the valley, it is said, can be traced in an almost due south direction (see Map I-1, inset) by several well logs. This valley appears to have been a pre-Wisconsin tributary of the Grand River. Although the valley has no modern topographic expression, it may prove to be important as an additional future water supplier for the City of Guelph. Ground water supplies are being increasingly used as our rivers are being converted by man to storm and septic sewers.

In summary then, the bedrock is generally flat-bedded Guelph and Lockport dolomite. Since it appears at the surface only in fairly small peripheral areas, it has had little direct effect upon the agriculture of the Township as a whole. It has, however, supplied materials for the

quarrying of man, and for the great scouring of the pleistocene
glaciations. It has therefore ensured a high lime content for the
mineral soils of Puslinch.



BURIED
PRE-WISCONSIN VALLEY

LEGEND

- x KNOWN OUTCROP
- QUARRY
- ⊖ ROCK FORMS SURFACE
- ASSUMED CONTACT

TOWNSHIP OF PUSLINCH
BEDROCK

CONTACT AFTER GOUDGE (LIMESTONES OF CANADA - Rpt 781, CAN. DEPT. MINES & RESOURCES, 1938)
WHO CONSIDERS ERAMOSA BEDS PART OF LOCKPORT FORMATION.

2. Pleistocene Deposits

The topography of Puslinch was formed by deposition in the waning phases of the Wisconsin Glaciation. Within the township are found two drumlin fields and two large moraines with their associated outwash deposits. The topography, when viewed in the field, is very complex and confusing; when deposits are plotted on a map, however, the moraines and their outwash show an almost parallel northeast-southwest trend, while the drumlins show an alignment at right angles to the moraines. A map of these deposits is given as Map I-2, page 18.

The northern boundary of Puslinch cuts across the southern portion of the Guelph Drumlin Field. The drumlins of this field within Puslinch are low, long, and broad, trending North 45 deg. West. Highway No. 6 skirts a fine example just south of the Guelph Township border; this drumlin (marked "a" on Map I-2) is one and one-half miles long, one-half mile broad, and a little over twenty-five feet high. Such is its distinction that it was shown on the surveyor's sketch of 1828. The interdrumlin swamps are, like the drumlins, long, broad, and shallow.

The drumlin field is cut through by large spillway channels now occupied by the underfit streams, the Speed and Eramosa Rivers. The valley of the Eramosa River is a fine example of a fossil spillway channel (see Plate I-1); it is seventy-five to one hundred feet in depth, and varies from almost a mile to under a half-mile in width. The valley shows triple terraces, especially notable on the north side along the boundary

road with Guelph Township. These indicate "that varying volumes of water flowed down the valley, first depositing beds of gravel, then later trenching them"².

Within Puslinch there are sections of two of the moraines of the well-known Port Huron, or Horseshoe, morainic system. Together, they cover nearly one-half of the area of the township, lending the topography a very rolling, even rough, aspect.

The Paris Moraine, described by Taylor (1913) as "one of the best-known moraines in Ontario", extends across the township from just south of Arkell in the east, to the vicinity of Puslinch Lake in the west. More than one-third of this moraine (within Puslinch) is mapped by Karrow (see Map I-2) as kame. Even in areas mapped as "Wentworth Till", gravels and cobbles are seen in profusion at road cuts. On the kame, the topography is one of confused hills, "rapidly undulating and swelling like a choppy and billowy sea"³. Undrained kettle-holes are not a common feature, due to the ready internal drainage of the material. Where they do occur, however (due probably to an underlying layer of silt or clay), they have been filled with soft organic material to depths of as much as thirty-five or forty feet.⁴ Over much of the moraine, especially on kame area, small cairns abound, where farmers have surrounded stubborn pine stumps with cobbles from the fields.

At Arkell this moraine shows a steep front, rising 175 feet from the Arkell Plain to an elevation of 1275 feet, the highest point in the township (see Plate I-2). The moraine becomes more subdued to the southwest, seldom having a relief of more than fifty feet. In the east, as well

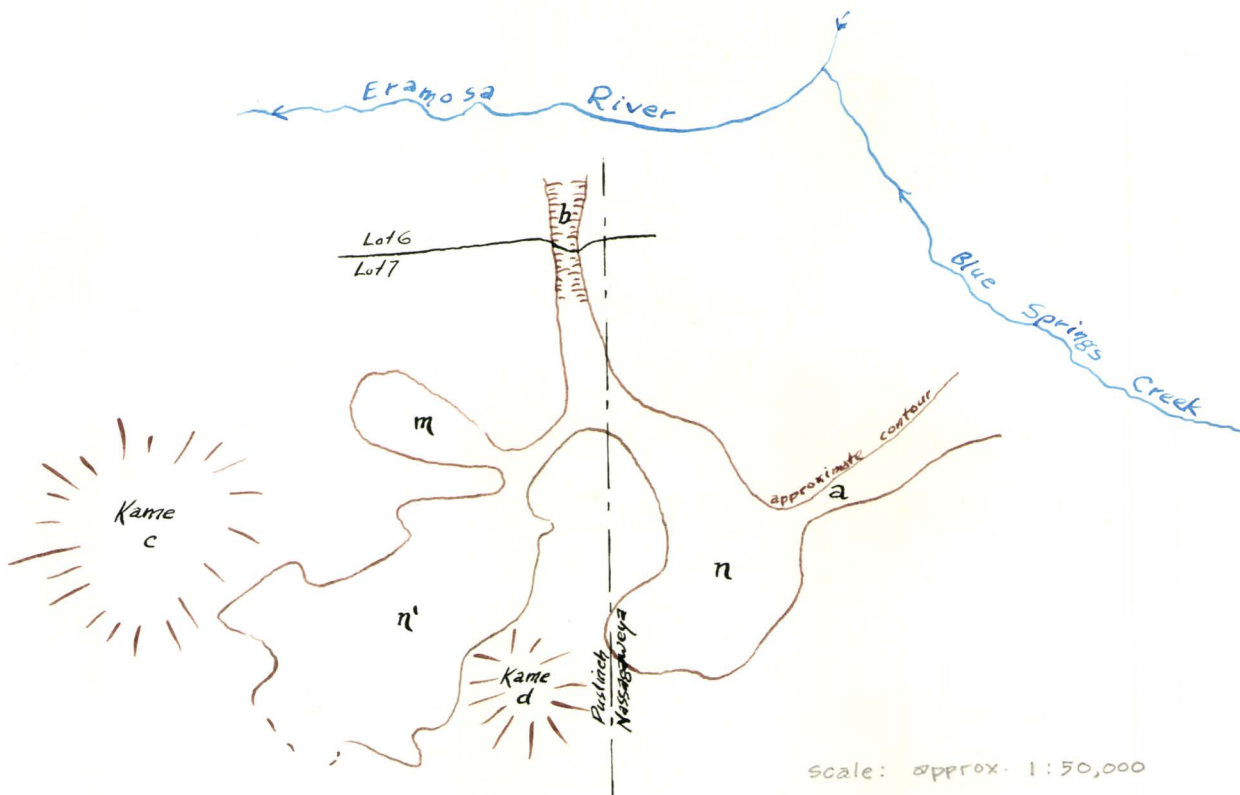
as being at its highest, it is at its broadest, having a width of three miles. Its southeastern side too, has a steep front, especially where it is formed of kame deposits (as on the Tenth Concession line road, see Plate I-3).

To the west, the Paris Moraine splits into two ridges. The secondary ridge (marked "b" on Map I-2), the more northerly of the two, follows the approximate line of the Fourth Concession. At its western extremity it becomes veneered with fine sand, and shows severe gully erosion on its steep slopes. It is cut by two outwash channels which apparently carried discharge from the Aikensville Re-entrant, the area of outwash separating the main and secondary ridges.

The main ridge continues unbroken to leave the township as a narrow finger, only two thousand feet in width, and of insignificant relief. Immediately outside the township, however, it coalesces with the wide Galt Moraine to the south and with the now large sand-veneered secondary ridge to the north, providing morainic topography in the townships of Waterloo and North Dumfries with a breadth of nine miles.

An interesting assemblage (marked "c" on Map I-2) occurs immediately east of the highest point on the Paris Moraine near Arkell. A very deep (50-75 feet) V - shaped dry valley cuts the road between Lots 6 and 7 near the eastern township border. It opens on the northwest to the Eramosa River valley; upstream it leads to two large bogs which now drain to the Blue Springs Creek, a tributary of the Eramosa. A sketch is shown on the next page.

Investigation of these features suggests that ice blocked the present outlet at (a), forcing meltwater to o'ertop the Paris Moraine and cut the channel (b); meanwhile, silts and sands from the kames (c) and (d) washed into the depression (n). When the ice block was removed from (b), the present drainage resulted, but depressions (m) and (n) were not fully drained; these filled with organic material.



Extensive outwash deposits slope from the Paris Moraine northward to the fossil spillway channels of the Speed and Eramosa Rivers. These are constituted for the most part of well-sorted large pebble or small cobble sized material.⁶ Borings at Arkell have revealed clean gravels at an elevation of approximately 1035 feet, giving them depths of more than forty feet. The Downey and Arkell Plains show little surface drainage due to the porosity of these gravels; springs from them above the Eramosa River at Arkell supply the water of the City of Guelph.

These large outwash plains appear to have formed from material brought down in meltwaters off the moraine via many small spillways (see Plate I-4). Often these spillways originate at kames, and have the outwash deposits arranged as fans at the lower end (these fans have little topographic expression, but can be distinguished by tones on aerial photos). In other cases, the channel has been merely cut into morainic material by relatively clear meltwaters, but in so doing has sorted the removed morainic material, leaving the gravels as part of the outwash plain.

The Aikensville Re-entrant is an outwash spillway (larger than those referred to above) which drained a substantial area of the moraine and two kames to the River Speed. This assemblage on a map (marked "d" on Map I-2) reminds one of an upside-down poodle dog. The head is Puslinch Lake -- a very shallow "bottomless" lake, likely a kettle-hole depression; the tail is a large swamp, different only in depth from Puslinch Lake. The tail, the rear legs, the body and the head drain through the front leg to the River Speed. The whole re-entrant is floored with outwash gravels and recent organic deposits.

The second large moraine through Puslinch is the Galt Moraine, south of, running parallel to, and very close to the Paris Moraine. Only in the centre of the township is there any appreciable distance between the two moraines, there amounting to two miles.

Although Karrow (1961) has shown much less kame on the Galt Moraine than on the Paris Moraine, they both exhibit a similar topography and many stones at the surface (see Plate I-6). Again, undrained depressions are not usual, but where they occur, they have been deeply filled with organic material. By analysis of the material from one of these organically-filled depressions near Crieff, the formation of the Galt Moraine has been dated at 11,900 years B. P.⁷

The crest of the Galt Moraine falls from a little above 1100 feet in the east to approximately 1000 feet in the west. The north front, unlike that of the Paris Moraine, is rather indistinct. The south front along the south-central boundary of Puslinch, however, is very abrupt, rising as much as one hundred feet in one-tenth of a mile (see Plate I-3). In the eastern portion of the township, the moraine is backed by the Badenoch Drumlin Field. Putnam (1943) described this area well by stating: "So intimate is the association of drumlins and moraine, that it is sometimes difficult to identify them."⁸ More will be said later of this drumlin field.

The Galt Moraine coalesces both in the east and in the west of Puslinch with the Paris Moraine. The watershed formed between these moraine ridges is that of the Galt Creek. Its upper reaches are in an area of kames where the two moraines coalesce in the east. Its central portion

is floored with flat-lying outwash gravels, mostly from the Galt Moraine, but partially from the Paris Moraine. Though the depth of these gravels has not been determined, an establishment near Aberfoyle has removed 15 feet of them and has cut a test pit 12 feet deeper. These materials, like those of the Downey and Arkell Plains, are well sorted and of small cobble or large pebble size (see Plate I-4).

A large part of the Aberfoyle Plain is covered with deposits of muck. Most of these are five to seven feet deep, but considerable areas are up to fifteen feet in depth. The floor of these muck-filled depressions appears to be gravel, and is immediately overlain by a yellow-grey marl (see Plate I-5).⁹ The soft, black, undecomposed organic material forms the bulk of the material in the basins and carries a dense cedar swamp.

It is suggested that these organic deposits have developed in a large lake basin covering the western half of the Aberfoyle Plain and caused by the constricted exit which the Galt Creek (as a spillway) was forced to make from the outwash basin.

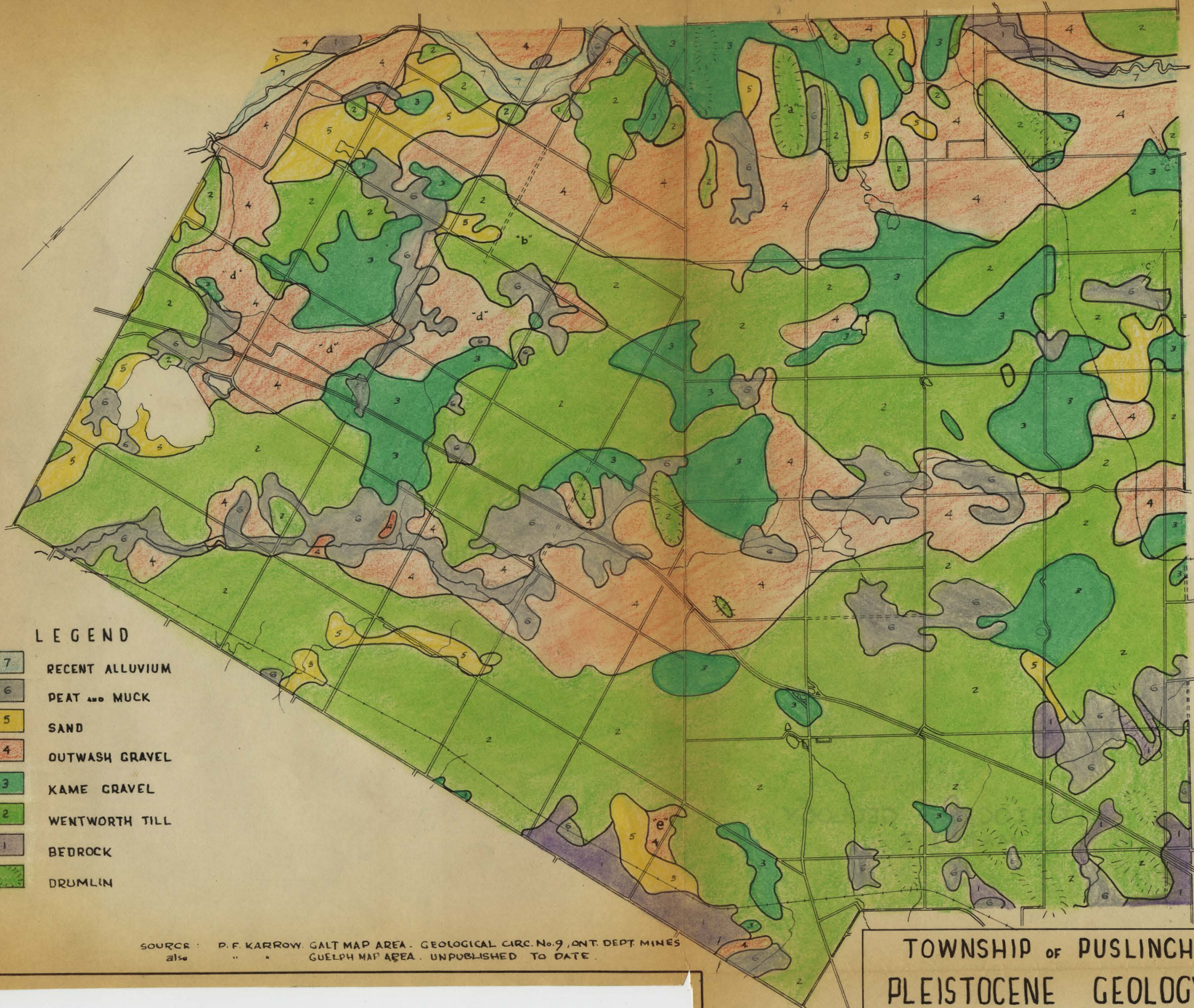
The Badenoch Drumlin Field, like the Guelph Drumlins, shows a loam material at the surface. They are not like the Guelph Drumlins in form, however. In the north, closest to the moraine, they are merely drumlinoid features, formed in the till. But in the south some fine true drumlins may be found. These are high (some are 75 feet and more in height), rather narrow, and short. Such a form, therefore, gives very steep slopes.

They are aligned in a direction of North 70 degrees West, and rest directly on the Lockport Dolomite bedrock. The headwaters of the

Twelve-Mile Creek, which drain the area, are controlled partly by the drumlin trend, and partly by the trend of low folds in the bedrock.

Along the township's southern border, and just west of Highway No. 6, the Pleistocene glaciations have exposed the largest area of bedrock in the township. Glacial striae here trend in a general Northwest direction (i.e. close to the drumlin trend). Along the road between Lots 30 and 31, Gore Concession, another interesting spillway assemblage (marked "e" on Map I-2) can be seen. Here it appears that outwash occurred to the south, against the ice. For this to occur, the ice must have withdrawn very irregularly, leaving a basin. Gravel and sand accumulated here to a height of a little over twenty-five feet, which, it may be postulated, was the height of the ice; any surplus material spilled over the ice. The ice front then withdrew, and the outwash water cut into the sand and gravel-filled basin, leaving a winding spillway channel entrenched below the level basin. The sand washed out in this process has formed a large flat deposit on the bedrock, now covered with a cedar swamp.

This, then, is the form and content of the Pleistocene deposits in the Township of Puslinch. Their general interpretation as moraines, as drumlins, and as outwash is obvious, but the interpretation of the sequence of events requires that one go outside of the township to trace these features and gain their broad relationships. For such considerations we must turn to the literature of the specialists in the Pleistocene of Southern Ontario. Such will be the treatment given in the next chapter.



LEGEND

- 7 RECENT ALLUVIUM
- 6 PEAT AND MUCK
- 5 SAND
- 4 OUTWASH GRAVEL
- 3 KAME GRAVEL
- 2 WENTWORTH TILL
- 1 BEDROCK
- DRUMLIN

SOURCE : P. F. KARROW. GALT MAP AREA. GEOLOGICAL CIRC. No. 9, ONT. DEPT. MINES
 also " " " " GUELPH MAP AREA. UNPUBLISHED TO DATE.

TOWNSHIP OF PUSLINCH
PLEISTOCENE GEOLOGY
 I-2

C.G.H. 1963

0 1 2
 miles



The ERAMOSIA RIVER valley, a fossil spillway
channel. Above, a panorama looking south
along the line between Puslinch and Nassagaweya;

Right, one of the three terraces; looking east
from the line between Puslinch and Guelph.



0. 2442



At Arkell, the Paris Moraine shows a steep front, rising 175 feet from the plain to 1275 feet, the highest point in the township. The Arkell Outwash Plain, foreground, is prosperous and well-kept.

Con. X, Lots 7-8.



Both the Paris and the Galt Moraines exhibit steep southern fronts, especially where they are formed of kame.

Above, the south front of the PARIS MORAINE,
at Con. 9, L. 20.



Left, the south
front of the
GALT MORAINE at
Lot. 30 of Gore.



The source of the material for the outwash plains was often at kames on the edge of the moraine, as at left.

Con. VII, Lot 27.

Small local spillways carried the material to the plains, sorting it on the way; see below.

Con. VII, Lot 26.



The material of the Aberfoyle Outwash Plain, as exposed at the pit of the Aberfoyle Sand and Gravel.

Con. VII, Lot 24.





During the construction of Highway No. 401, five to fifteen feet of soft black organic material was excavated from swampy sections of the Aberfoyle Outwash Plain, revealing a layer of yellow-grey marl resting upon a gravelly bottom. As the highway fill was pushed forward, a black "soup" was extruded from beneath it, and was removed by dragline.

Material excavation cross-sections were taken from a boat, a rather novel method of highway surveying.

Con. II, Lot 19



PLATE 5

31 117A



Scattered cairns of stones and rolling to hilly topography is characteristic of the Galt and Paris Moraines.

Gore, Lots 30-31.

3. Interpretations of the Deposits

Within the past million years, the poleward regions of the globe have been subjected to repeated attacks by the ice. The topography of Puslinch is attributed to the final stages of the last, or Wisconsin, glaciation.

The waning of the Wisconsin began as a split occurred in the ice along a line from Orangeville to London. With further retreat, the ice took the form of lobes, each with an axis of movement related to the basins of the Great Lakes. The land left by this lobal retreat of ice was an island of land within a sea of ice, and has been given the name "Ontario Island".¹⁰

Now, it would appear that the ice had downwasted considerably before the Orangeville-London split occurred. And it would also appear that downwasting and backwasting occurred as the Erie-Ontario lobe retreated from the "Ontario Island". No moraine was built at the limits of the till found within Puslinch (called the Wentworth Till by Karrew 1959, see Map I-2); a fairly even cover of debris was left as the ice retreated from the "Island".¹¹ It is generally accepted too, that at this stage of retreat to the vicinity of Guelph, the Erie-Ontario lobe uncovered the drumlins of the Guelph Field, while meltwater both cut at them and deposited gravels about them.¹² Map I-3a attempts to show the sequence thus far.

It is at this point that the interpretations vary, for it is also at this point that material for interpretation becomes more abundant. Chapman and Putnam (1951) appear to hold that the Paris moraine was built during a long interval of immobility of the Erie-Ontario lobe. While the ice front remained stationary at the Paris moraine, the Huron and Georgian Bay lobes alternately retreated and readvanced, each partially overriding the moraines that the other had just built. During this time also, the Erie portion of the Erie-Ontario lobe was rapidly retreating from the Lake Erie basin -- but still the Ontario portion of the lobe remained at the Paris Moraine.

Then, "the second longest halt experienced by the Wisconsin glacier in Southern Ontario was at the Port Huron moraine [system],"¹³ The Huron lobe built a complex moraine of two or more strands; in the south, the Paris and Galt moraines represent the work of the Erie-Ontario lobe. Thus, according to this interpretation, the Paris moraine can be attributed both to the long stand before the Port Huron system proper and to the period during the building of this great horseshoe system. The Galt moraine is solely a strand of this Port Huron system.

Throughout this time, glacial drainage from both the Lake Simcoe area of the ice front, and from the Paris moraine front was spilling down the great channel of the present Eramosa River, through the Guelph drumlin field, and down the Grand Valley to meet the waters of Lake Whittlesey at Brantford.¹⁴

And it is due in large part to the Brantford delta of this spillway that the 'long stand' thesis of Chapman and Putnam is plausible.

The noses of both the Huron and Ontario lobes lay in Lake Whittlesey and great meltwater streams ran along the ice fronts, emptying into the lake at Hensall and Brantford. The splendid development of these moraines and spillways testify that this position was occupied by the ice for an extended period. The immense delta south of Brantford must, also, have required a long time for its formation.¹⁵

But in 1943, Chapman and Putnam held to the interpretation of Taylor, the first serious student of the moraines of Southern Ontario.

Taylor (1913) gave the following introductory statement:

We are compelled to believe that moraines were built at halts following movements of retreat as well as at those following movements of advance. But the moraines formed at climaxes of retreat were always overridden and obliterated at the next advance. From this fact it follows that the moraines which we see and study were made at successive climaxes of readvance during a general movement of retreat.¹⁶

Chapman and Putnam, in their paper on the drumlins of Southern Ontario (1943) reiterate Taylor's view that "deglaciation proceeded with only minor interruptions until all of the Horseshoe [Ontario Island] was uncovered"; they go on to state "How much farther it extended we do not know, since the readvance [*my italics*] to the Horseshoe moraines has obliterated all traces."¹⁷

Karrow (1961) takes a more statistical approach, and is working as much with content as with form. According to his preliminary report, the Wentworth Till (Guelph and Badenoch Drumlins and Galt and Paris Moraines) were definitely deposited by westward-moving ice.

During retreat,

large quantities of meltwater distributed sand and gravel in extensive outwash deposits; close to the ice, cones and irregular heaps of gravel formed kames.¹⁸

As well, he states, "scattered eskers, numerous kettles, and large kame

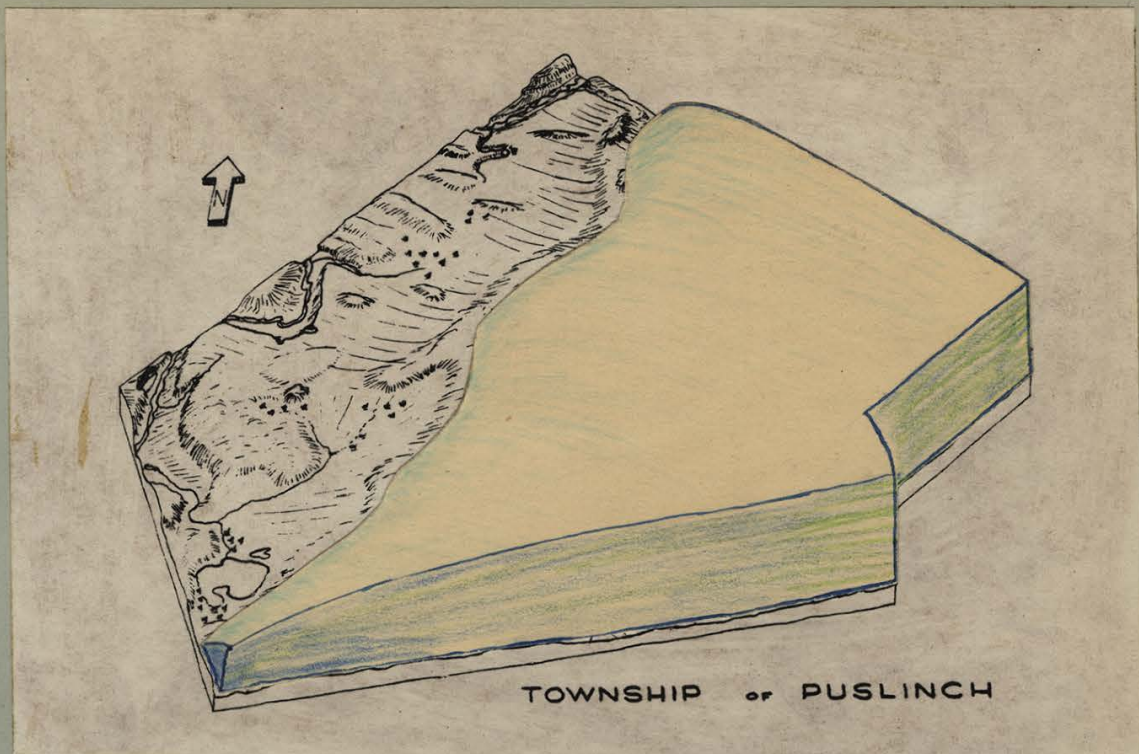
deposits indicate that the ice sheet stagnated while melting away."¹⁹

His final report is not to be published until April of 1963, but, in interviews, he favours the idea that the Galt Moraine is a product of a slight ice readvance. This would appear to be the case, though I can find no powerful evidence to reinforce my impression. The intimate association of the Badenoch Drumlins with the Galt Moraine, and their often gravelly texture suggest the reworking of previously laid deposits. The well-sorted gravels of the Aberfoyle Plain, but the narrow exit from the Plain in the southwest suggest a readvance of the ice after the gravels were laid down, blocking the further exit of water and creating a shallow lake. This also would account for the marls found to underlie the present areas of muck. A comment of a gravel-pit employee on this Aberfoyle Plain that to the east of the pit (on the Galt Moraine) "you have to dig deep for the gravels" also suggests that the moraine was pushed over some previously-laid gravels.

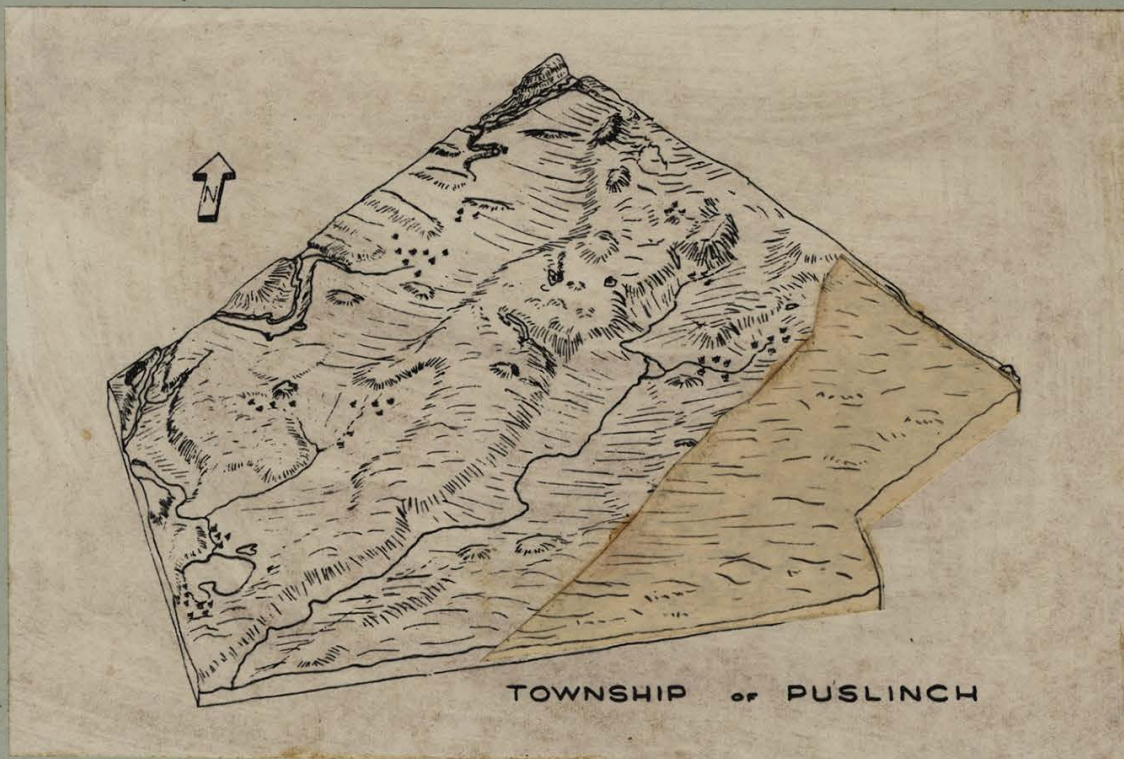
Chapman and Putnam's (1949) evidence of the well-developed spillway system, and of the delta at Brantford, would seem to be powerful enough to allow acceptance of their "long-stand" hypothesis for the Paris Moraine.

Further work will have to be done on a content and statistical basis, possibly much of it on well-log interpretation. On the basis of present evidence, however, we may conclude that the Guelph Drumlins were laid down under the ice while it covered Ontario Island. The Paris Moraine is a product of a stand of the Erie-Ontario lobe previous

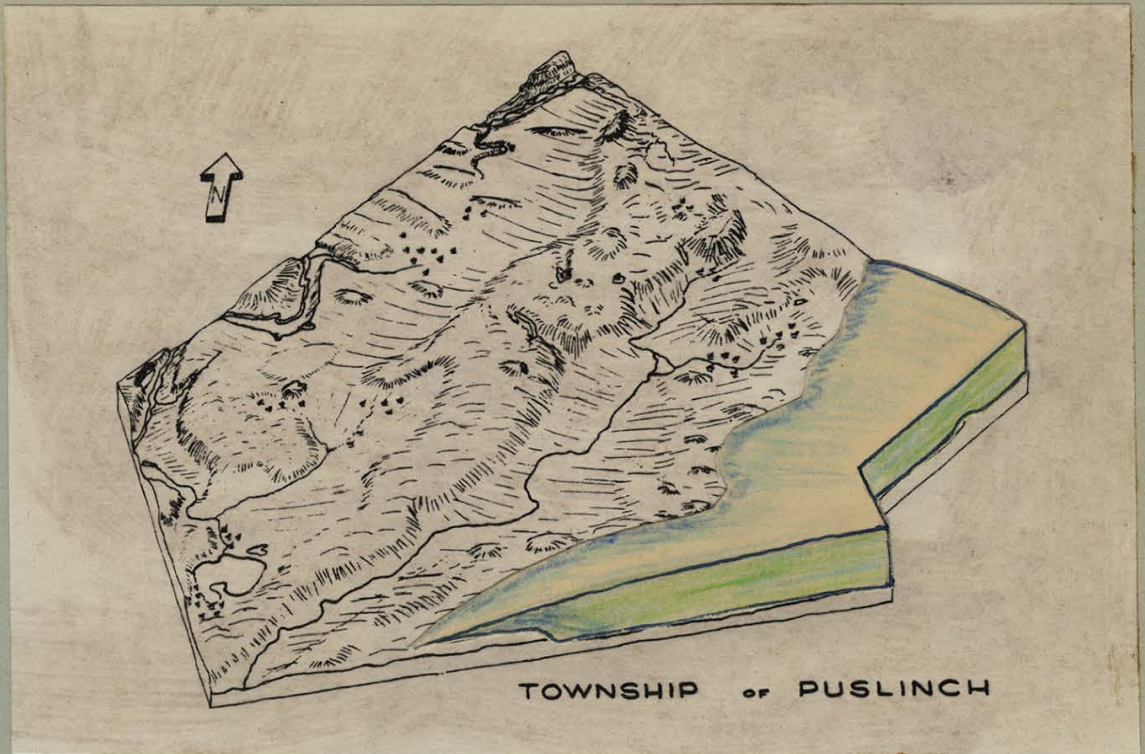
to and during the building of the Port Huron Morainic System. The gravels of the Downey and Arkell Plains were washed down from it by meltwater. The Galt Moraine is a product of an ice readvance of unknown magnitude (but likely small), which reworked previous deposits to form the moraine and the drumlins closely associated with it in the Badenoch area. The ice then retreated from the township.



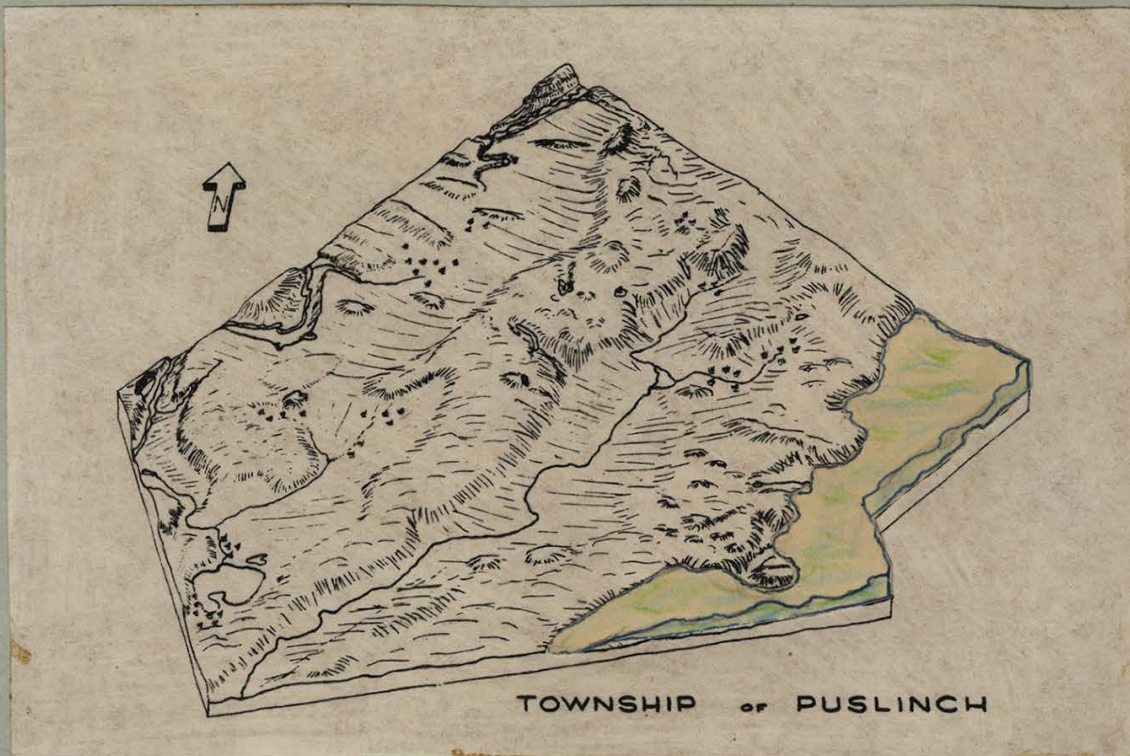
(a) The retreat of the ice from the "Ontario Island" uncovering the Guelph drumlins; the long stand at the Paris Moraine.



(b) A retreat to beyond the Galt Moraine, leaving outwash and morainic debris.



(c) A re-advance to form the Galt Moraine.



(d) Stagnating retreat from the township.

4. Drainage²²

The Township of Puslinch feeds into three extensive river systems. Thirteen square miles in the eastern corner of the township are drained by the headwaters of the Twelve-Mile Creek, which debouches into Lake Ontario at Bronte. The southern ten square miles drains into the Spencer Creek, which via the Beverley Swamp and Webster's Falls, empties into Coote's Paradise and eventually Lake Ontario. The remaining portion of the township, that north of the Galt moraine, is within the watershed of the Grand River, which finds its outlet into Lake Erie.

The Puslinch headwaters of the Twelve-Mile Creek are defined amongst the Badenoch drumlins; the source is, however, the south slope of the Galt moraine. The most westerly tributary has its source in a kettle lake near Morriston; it flows in a rather straight path to the south-east and is soon out of the township. Much of this tributary has only intermittent flow.

A tributary in Concession IX has its source high on the moraine; flow is intermittent until it reaches the interdrumlin swales, where it gains cold permanently-flowing waters.

The final tributary of The Twelve in Puslinch enters the township with an intermittent flow from a dozen square miles of drainage area, and acquires a permanent flow in the inter-drumlin Badenoch swamp. Just south of the Puslinch border, The Twelve-Mile Creek Conservation

Authority proposes to erect an earth-fill dam, flooding 400 acres of wet land. Associated with the reservoir would be almost 1,000 acres of conservation land. The scheme would yield recreational area and approximately 400 acre-feet of additional summer flow per month.

The headwaters of the Spencer Creek also share the south slope of the Galt moraine. In Puslinch, short lengths of four tributaries drain almost due south. The western two dry completely in most summers, but the eastern two maintain a cold summer flow. Much of their length in Puslinch is through swamp-covered outwash sands and gravels.

North of the Galt moraine, the township drains to the Grand River. One of the tributary watersheds, that of the Galt Creek, is almost completely within Puslinch. This creek (known locally as Mill Creek) drains the thirty-three square mile area between the Galt and Paris moraine in Puslinch, with its sources in the confused topography north-east of Aberfoyle. The eleven square mile area upstream of Aberfoyle is very swampy, and yields a continuously cold flow. The Aberfoyle "Peat Bog" was the subject for a study by the Canadian Geological Survey, who deemed it suitable for peat fuel.²⁰ The permanent flow through the area also was conducive to a mill site. Extensive drainage changes were created by an early inhabitant; eventually a dam and mill were completed.

Below Aberfoyle, the creek meanders across gravel outwash plains. Much of this plain is covered with cedar and tamarack swamp. Borings and cuttings into these swamp-covered depressions have revealed a gravel

bottom covered with a fairly thin layer of yellow-grey marl; above this as much as fifteen feet of organic material has accumulated.

During the original land survey in 1831, it was noted at Lot 10 on the First Concession line that "although the Galt Creek is of sufficient size for driving any common machinery used in the country the banks are low and there seems to be very little fall in the River."²¹ No dams are known to have been built below that at Aberfoyle.

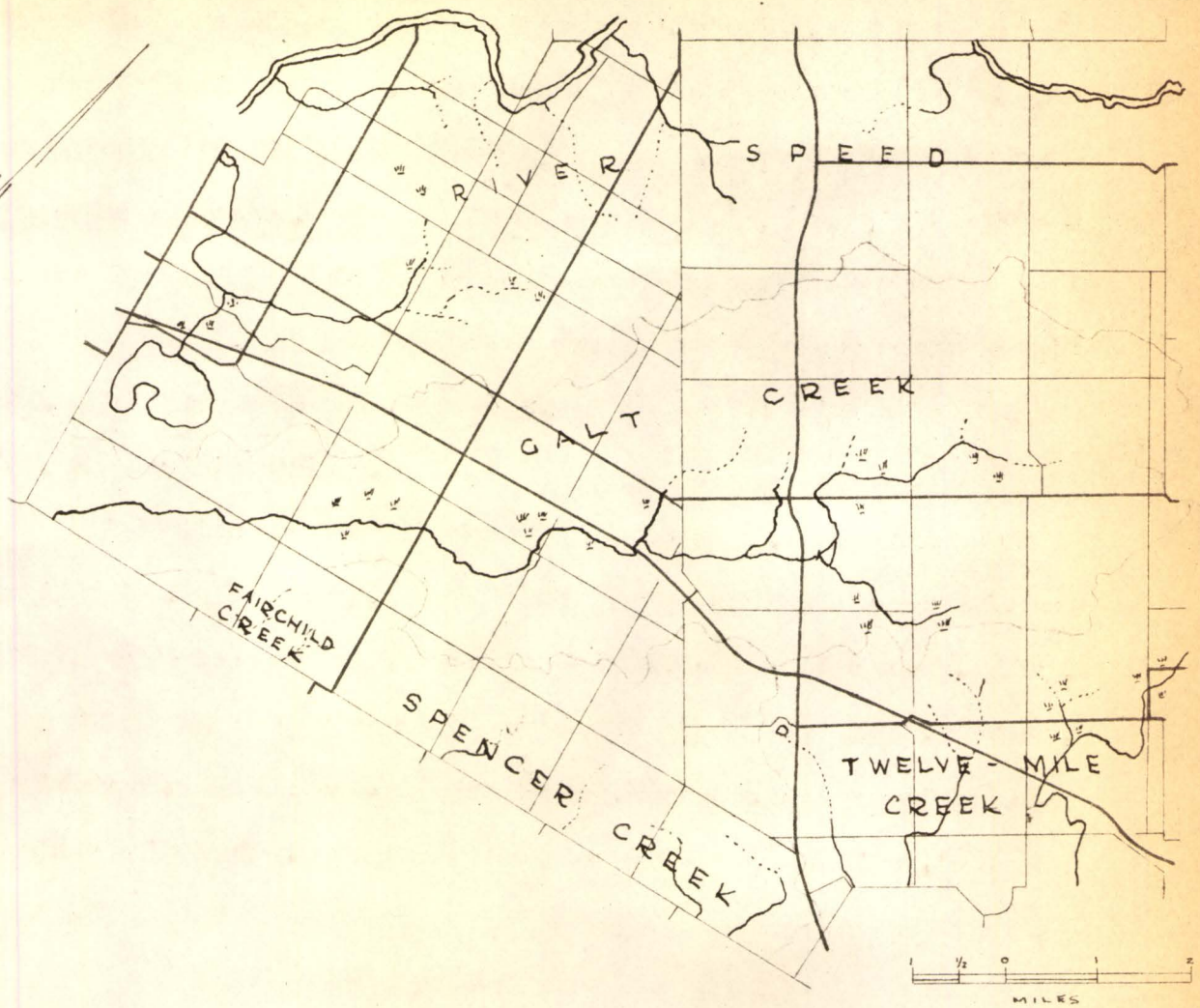
The large area north of the Paris moraine and north-east of the Puslinch Lake area is drained by a number of small permanently-cold tributaries of the Rivers Speed and Eramosa. These two major streams themselves also cut through the township, running much of their course in Puslinch upon bedrock, occupying only a small portion of the channel of their powerful glacial ancestors.

Mill sites were possible on both these streams, noted the original surveyor in June of 1831. They were running slow, from two to five feet deep, and almost one hundred feet wide.²³ They were, in fact, later much used at places outside Puslinch; only at Cook's Mills, near Arkell (see Book II, p.94) was the Eramosa River put to work.

Puslinch Lake, covering an area of 650 acres -- "the largest natural body of fresh water between Toronto and the Great Lakes"²⁴ -- is, however, very shallow. It is ground-water fed and drains by a tributary of the Speed known as The Outlet. The Outlet gains a tributary shortly after leaving Puslinch Lake. The full drainage area of The Outlet at the Puslinch-Waterloo Township line, then is approx. 14 sq mi; here the stream has been dammed, and for many years supplied power for a large saw-mill.

In summary then, the Galt Moraine in Puslinch forms a water divide between the drainage into Lake Erie and that into Lake Ontario. Drainage is still disorganized by Pleistocene deposits, and has made little modification of them. The Arkell and Downey outwash plains, with high porosity and the proximity of major rivers, have developed a very open drainage texture. The Aberfoyle outwash plain, with similar deposits, has its outlet to the major river crowded with less permeable morainic material, and has developed much swamp and undecomposed organic cover. The streams to the south of the Galt Moraine gain their flow from cold morainic springs.

Mill sites are not plentiful in the township. The Galt Creek runs in a low, often mucky, channel; the large Speed and Eramosa Rivers require large stone and earthworks in order to be used for power. Thus, only a fairly large concern would be able to utilize the Speed, Eramosa, or Galt Creek. Small, one-man mills could, however, be established on the minor tributaries. This was to be the pattern in Puslinch.



TOWNSHIP OF PUSLINCH
DRAINAGE

FIG. I-4

5. Soils

Soil is a natural body, differentiated into horizons of mineral or organic constituents, usually unconsolidated, of variable depth, which differs from the parent material below in morphology, physical properties, chemical properties, and biological characteristics.¹⁵

Soil is but a thin mantling upon the parent material from which it was formed. It is one of man's greatest resources, for from it comes most of the food that he eats. Yet it can be destroyed quickly by man's ignorance or slovenliness, and can be replaced only at rate of something like one inch per thousand years.

Here, in Puslinch, with a Humid Mesothermal climate and a generally deciduous forest cover and with diverse Pleistocene deposits and Silurian rock as parent material, time has developed complex sets of soils. The dominating soil-forming process in this area is that of Podzolization, and where topography has been friendly, this has developed the grey-brown podzolic soil. Where soil drainage has been poor, however, dark grey gleisolic soils -- and in extreme cases even peat and muck -- have developed. In some rather small areas¹⁶ of Puslinch, glaciation has swept all weathered rock materials from the surface, so that in the little more than ten thousand years since the retreat of the ice, scant material has been weathered as potential soil. A map of soils is presented as Map I-8.

By far the largest acreage of the township is represented by the

DUMFRIES loam catena, which, through podzolization, has developed upon the stoney, calcareous loam of the Galt and Paris moraines. These moraine locations have often steep, irregular slopes, and many stones throughout the profile. Analysis²⁷ has shown that within Puslinch the Dumfries topsoil averages 45% sand, 38% silt, and 17% clay. The organic content is low -- about 3% -- and the pH averages about 7.6. It is often low to very low in phosphorus, and medium to low in potash and nitrogen. These facts mean that the Dumfries soil must be treated with care; under cultivation it requires liberal application of manure, and of chemical fertilizers. Its irregular and often steep slopes make difficult such practices as contour plowing; these steeper slopes would be best left under grass or forest cover.

The imperfectly-drained member of this catena is KILLEAN loam. Its characteristics are much the same as Dumfries, but it exhibits some mottling in the B horizon; working of this land would therefore be delayed slightly in the spring.

The poorly-drained member of the catena is LILLY loam, which occurs in hollows associated with the moraines. It is a very late soil in the spring, and exhibits poor drainage throughout much of the year. It is therefore little suited to cereal grains or legumes, and is best used for grasses or forest.

These members of the Dumfries catena cover approximately 27,500 acres or 45% of the area of Puslinch Township. The limitations they impose, therefore, should be considered powerful limitations upon the township in general.

The second-largest soil catena in Puslinch is that which is composed of BURFORD loam and its imperfectly-drained and poorly-drained partners, BRISBANE loam and GILFORD loam. These soils, covering approximately 14,700 acres, have developed upon outwash gravels of the Arkell Plains, Downey Plains, Aberfoyle Plain (see Orientation Map, p. 5), and other smaller, more local, deposits. The parent material, then, is well sorted gravel and presents a nearly level to gently sloping topography. The gravel parent materials allow the opportunity for extreme internal drainage, but the level surface counteracts this tendency unless ground water is withdrawn by means natural or artificial. The Arkell and Downey Plains proper are well-drained by the deep valleys of the Eramosa and Speed Rivers respectively; they show, therefore, very little of the Gilford loam, in contrast to the Aberfoyle Plain which is drained only by the small, meandering, Galt Creek.

Stones are prevalent in these soils, but are small and well sorted, and hence rarely interfere with cultivation (see Plate I-7). Analysis²⁰ of the Burford loam indicates an average topsoil texture of 36% sand, 43% silt, and 21% clay. Organic material averages about 4% and pH about 7.6. The inherent fertility of these soils is fair to low, but they will respond well to applications of commercial fertilizer. The moisture deficiencies which commonly occur every growing season (see page 44, Climate) are particularly noticed in the Burford loam; careful utilization of moisture is therefore basic to best use.

Another important soil catena is the GUELPH loam. This covers

an approx. area of 7,400 acres, and is developed upon a pale brown, calcareous loam parent material. This is the grey-brown podzolic soil of the drumlin topography, and hence is found in conjunction with the Burford loam on the Arkell Plain (this being a southern portion of the Guelph drumlin field, which is interlaced with outwash.) A second large area of Guelph loam occurs in the drumlinized region of southern Badenoch. Here, its poorly-drained associate, Parkhill loam, occurs in the inter-drumlin swales.

The Guelph loam is a very good agricultural soil; it has returned some of the highest yields in the county, in many cases doubling those from the Burford soils. Slopes can be a problem, but contour plowing is eminently suited to the drumlin form. The steeper slopes, however, are best kept in grass or tree cover. The Parkhill soils, being poorly-drained and often without an easily constructed outlet, are also best suited to grasses and forest. It is upon the soils of this catena that the interesting patterns of conservation land use are best illustrated. Tile drainage -- or alternately, grassland or forest uses -- of swales (see Plate I-8), long rotations of legumes on less severe slopes, and careful cultivation of flatter land give the farmer full opportunity to develop his complex land to its highest uses. But to do this the operator must be well-acquainted with conservation practices and have the initiative to apply them.

Five soil series plus other organic deposits cover the remaining 12,100 acres of the township. Some of these, though relatively small in acreage, are nevertheless important.

Since the Township of Puslinch was physiographically moulded under the influence of much water, and since it had within itself the source of much of this water, the dominant soil parent material has been gravelly. In some places, however, where the glacial spillways were smaller and more local, some sand has been sorted from the gravels. These sands have developed the soils of the FOX catena. The Fox sandy loam is a well-drained, grey-brown podzolic soil upon a medium-textured calcareous sand parent material. Podzolization has tended to leach the soluble minerals and clay particles from the A horizon and to deposit them in the B horizon. This means that the B horizon will have the best water-holding capacity. But the depth to the B horizon varies greatly in the Fox soil: it may change by as much as a foot vertically within a foot horizontally. This factor, combined with the soil's extreme lack of natural nutrients and organic material, may often make this a difficult soil to manage.

The dark grey gleisolic member of this catena is GRANBY sandy loam. It occurs in interdrumlin areas in the Badenoch vicinity, and along the north bank of the Eramosa River in the far north of the township. This soil is saturated with ground water for much of the year, and is therefore not well suited to agricultural endeavours unless artificially drained.

HILLSBURG fine sandy loam is developed from fine to medium sand which is underlain at varying depths by loam till. This soil exhibits good drainage, which varies according to the depth to till. Its

characteristics are almost identical to those of the Fox sandy loam. Steep slopes create a serious erosion problem; this soil should be kept in permanent vegetation, and, in cases extremely prone to erosion, in trees.

A number of small areas of COLWOOD fine sandy loam are also found scattered through the eastern portion of the township between the Paris and Galt Moraines. This is a dark-grey gleisolic soil developed upon poorly-drained deposits of calcareous fine sandy loam and silt loam. These are lacustrine deposits, related to areas of ponded outwash. With artificial drainage and proper fertilization, these soils can be made quite productive.

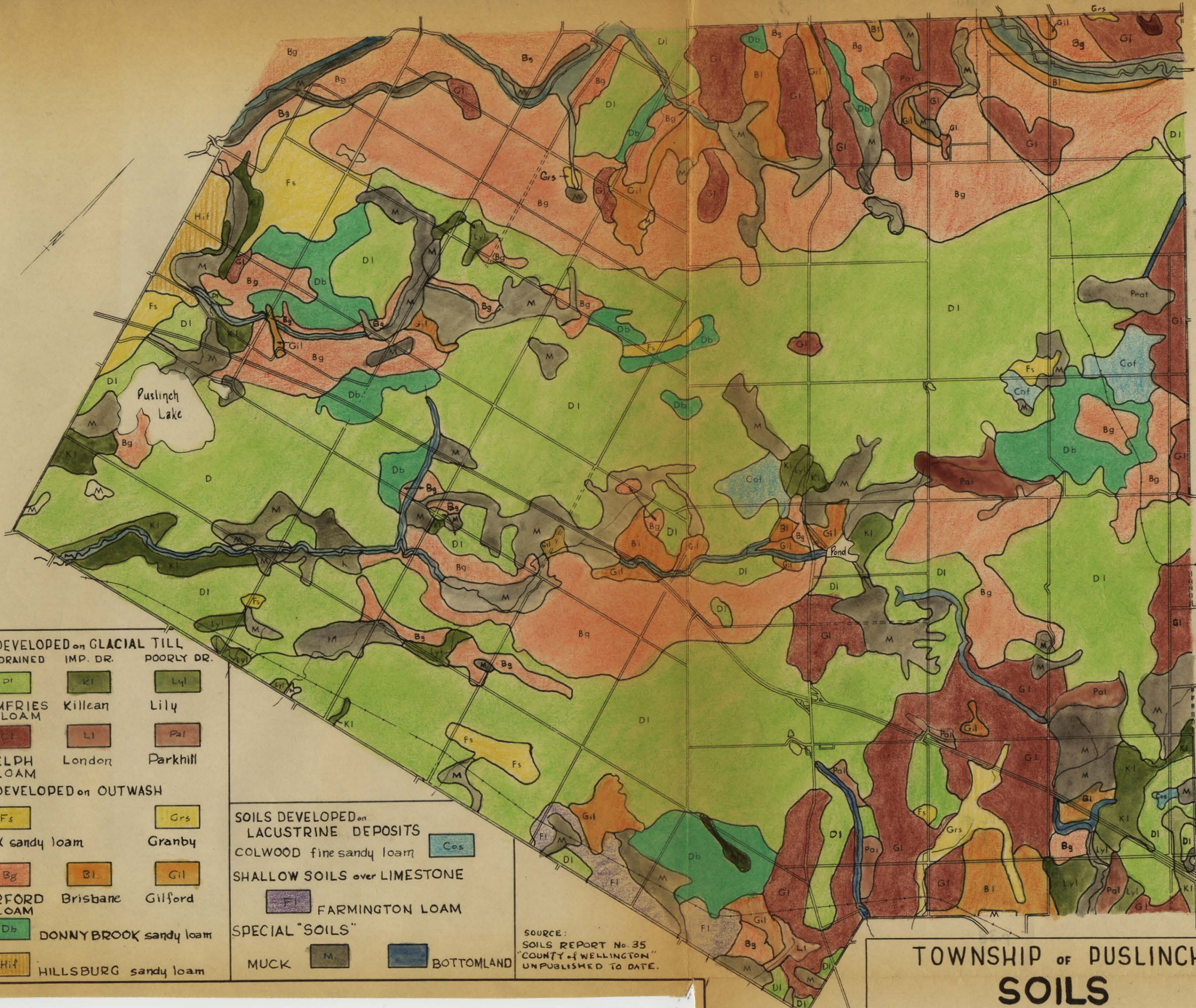
DONNYBROOK sandy loam is a grey-brown podzolic soil which has developed upon the coarse gravel and cobble surfaces of the kames. It is a thin, droughty soil, and is classed as non-agricultural. Its role here is that of a necessary evil that must be stripped from new gravel pits.

FARMINGTON loam is also of little use for agricultural pursuits. It is shallow and droughty, being developed in a short ten-thousand years from the underlying Silurian dolomite and a small amount of glacial debris left upon its surface. It is classed as a brown forest soil. It may be used for short portions of the year as grazing land, but has a very low carrying capacity. Improvements to Farmington loam are not considered worthwhile.

PEAT and MUCK represent accumulations of organic material in depressions which are permanently saturated with water. Decomposition

is thereby retarded, and great depths of brown to black material accumulate. Large areas of these deposits occur on the outwash between the Galt and Paris Moraines due to the flat topography with slight depressions. Attempts, some successful, have been made elsewhere in Ontario to use similar deposits for market gardening; such developments in Puslinch would not be economically warranted at this time. Their best use at present is the production of cedar trees for the post and pole industry.

In summary, the three most common soils in Puslinch are: the Dumfries loam, of only fair inherent fertility, and found upon the irregular Galt and Paris Moraines; the Burford loam, of only fair inherent fertility but adapted to commercial fertilization due partly to its location upon the flat outwash gravels; and the Guelph loam, of a high inherent fertility but susceptible to erosion due to its location on the drumlins of the Guelph and Badenoch fields. Muck is common on the outwash plain between the Galt and Paris Moraines, and is best adapted to the growing of trees.



SOILS DEVELOPED on GLACIAL TILL

| | | |
|--------------------|--------------------|-----------------------|
| WELL-DR. DI | IMP. DR. KI | POORLY DR. Lyl |
| DUMFRIES LOAM | Killean | Lily |
| GI | LI | Pal |
| GUELPH LOAM | London | Parkhill |

SOILS DEVELOPED on OUTWASH

| | | |
|----------------|-----------------------|------------|
| Fs | Grs | |
| FOX sandy loam | Granby | |
| Bg | BI | Gil |
| BURFORD LOAM | Brisbane | Gilford |
| Db | DONNYBROOK sandy loam | |
| Hif | HILLSBURG sandy loam | |

SOILS DEVELOPED on LACUSTRINE DEPOSITS

| |
|-------------------------|
| Cos |
| COLWOOD fine sandy loam |

SHALLOW SOILS over LIMESTONE

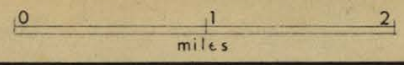
| |
|-----------------|
| F |
| FARMINGTON LOAM |

SPECIAL "SOILS"

| | |
|----------|-------------------|
| M | Bottomland |
| MUCK | BOTTOMLAND |

SOURCE:
SOILS REPORT No. 35
"COUNTY of WELLINGTON"
UNPUBLISHED TO DATE.

TOWNSHIP OF PUSLINCH SOILS





If an outlet can be found, TILING can often be used to correct impaired drainage.

Con. IX, Lot 30.



But in the drumlin fields, the swales must often be left in trees or grasses. Here, instead of draining, the swale has been dammed to form a pleasant and useful farm pond.

Con. VIII, Lot 3.

6. Agricultural Land Capability

The areas of Puslinch which reveal the fewest physical problems for cultivation are those which have developed the Burford loam soils. These are relatively flat, and therefore not much subject to erosion; they show many large pebbles throughout the profile, but they are small enough that they rarely interfere with cultivation. Though these Burford loam outwash plains are not inherently high in fertility, commercial fertilizer can be profitably applied. The Arkell, Downey, and parts of the Aberfoyle outwash plain, then, are the township's best land for intensive agricultural utilization.

Many areas of the outwash plains and the drumlin fields are shown on the soils map as muck. These are permanently saturated with water, and cannot be profitably drained for agriculture. They are best used for forest.

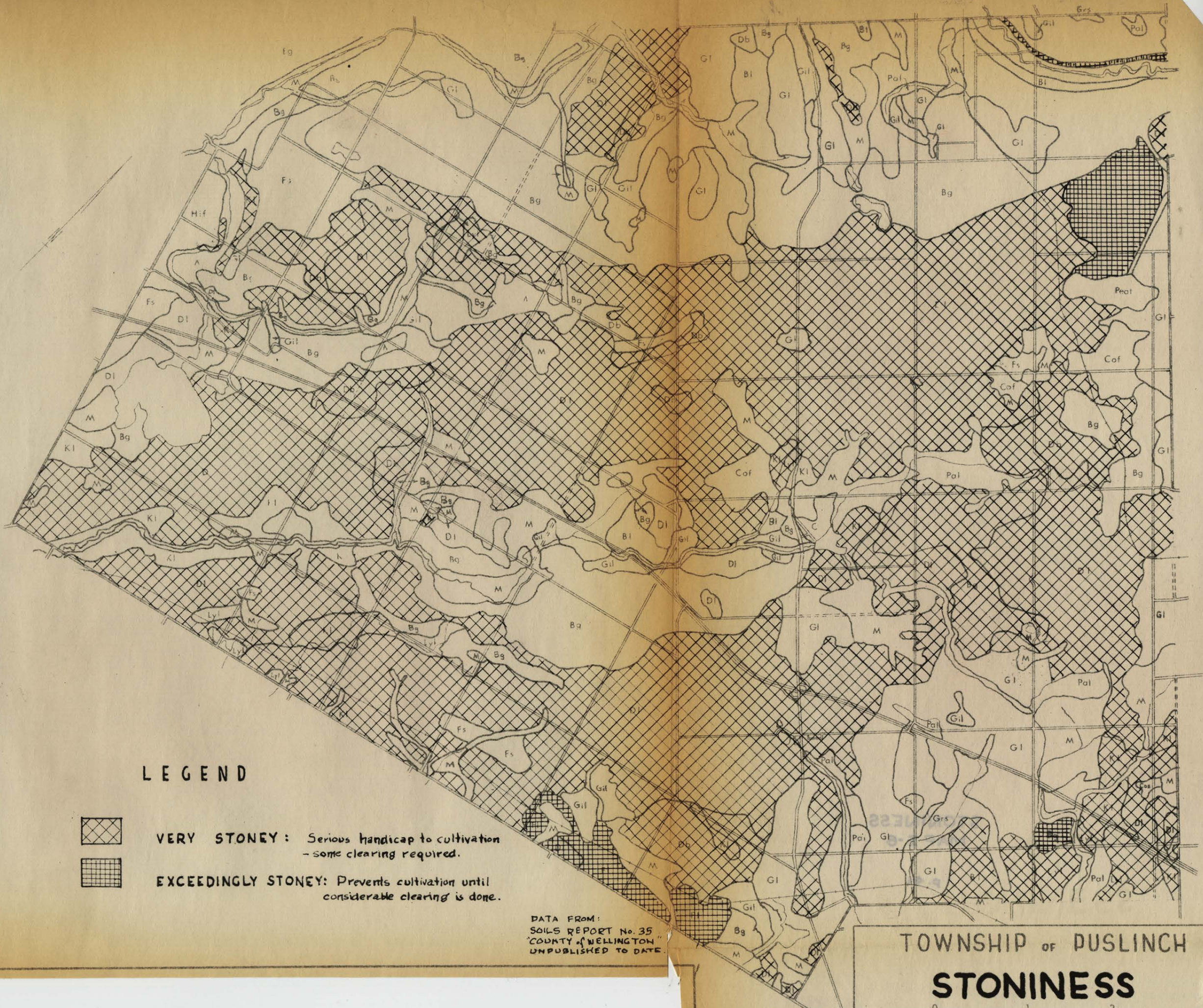
Two other major problems are shown on Map I-6 Stoniness, and Map I-7 Slope.

The stoniness map refers to the original condition of the land. Five categories were used, from "stone free" to "exceedingly stoney"; the last two categories only have been shown on Map I-6, so that the areas cross-hatched would present a serious handicap to cultivation until clearing was done (see Plate I-9). It can be seen that practically all areas of Dumfries loam (i.e. the moraines) are in this category. Though this represents original condition of the land,

stone clearing is still an almost annual chore. The few areas classed as "exceedingly stoney" are associated either with bedrock near the surface, or with kames. At the best, they can provide only rough grazing (see Plate I-9).

When the map of slope is considered alongside the map of stoniness, it can be seen that the moraines present both hindrances to cultivation. Of six categories of slope, only the last three -- moderate, steep, and very steep slopes -- are shown on Map I-7. The areas shaded, then, would present substantial potential for erosion. Contour plowing may be possible on the areas with uniform slopes (shown as stippled), but the areas with basin topography (cross-hatched) offer no such possibility. The drumlins of the Badenoch Field are almost the only locations that show steep slopes but not a hindering stoniness.

In summary then, almost two-thirds of the Township of Puslinch presents moderate or severe handicaps to cultivation. The only relatively large acreages that could be considered as high quality land for commercial farming are the Burford loams (and Guelph loams, where they occur) on the Arkell, Downey, and Aberfoyle plains.



LEGEND



VERY STONEY: Serious handicap to cultivation
- some clearing required.



EXCEEDINGLY STONEY: Prevents cultivation until
considerable clearing is done.

DATA FROM:
SOILS REPORT No. 35
"COUNTY OF WELLINGTON"
UNPUBLISHED TO DATE.

TOWNSHIP OF PUSLINCH
STONINESS

0 1 2
miles

C.G.H. 1962



TOWNSHIP OF PUSLINCH
SLOPE

DATA FROM:
SOILS REPORT No. 35
"COUNTY OF WELLINGTON"
UNPUBLISHED TO DATE.

LEGEND

| UNIFORM TYPE | BASIN TYPE |
|--------------|-------------------|
| ••••• | |
| ••••• | |
| ••••• | |
| | MODERATE |
| | STEEP |
| | VERY STEEP |

C.G. 1913



Stoniness of the Dumfries loam on the moraines constitutes a serious handicap to cultivation until clearing is done. Above, a field is being brought under cultivation after standing as permanent pasture.

Con. I, Lot 20.



Areas classed as exceedingly stoney can provide at best only rough grazing.

Left, Farmington loam,

Con. IX, Lot 2.

7. Climate

The climate of Puslinch may be investigated through the forty-four years of records available for the meteorological station at Guelph.²⁹

The growing season here (days with mean temperature above 42 degrees F.) is approximately 196 days;³⁰ this is one to two weeks shorter than that of the Hamilton area, but almost a week longer than the northern half of Wellington County. Harvest in Puslinch comes a week or more after that in communities only twenty miles to the south.

The July mean temperature is 68 deg. F, while the avg. maximum for that month is 79 deg. F. The January mean temperature is 20 deg. F, and the avg. maximum at that time is 27 deg. F.

Annual snowfall averages 51.1 inches, about one foot more than the Niagara Peninsula below the escarpment, but about the same as the north shore of Lake Ontario from Oshawa to Hamilton. Most of this snowfall comes in the months of December, January, and February.

The monthly averages for temperature and precipitation are set down at the top of Table I-A. Note that temperatures are given in degrees centigrade, and that precipitation is given in centimeters.

Graph I-8, a station graph drawn in accordance with Thornthwaite's climatic scheme, also reveals significant facts.

Thornthwaite, in devising this scheme, recognized that some precipitation runs off, some evaporates directly, some soaks into the

soil, and some is transpired by plants. If precipitation and soil moisture cannot supply the needs of plants, then these plants experience physiological drought.

A significant finding was that

... as long as the root zone of the soil is well supplied with water, the amount of water transpired from a completely covered area will depend more on the amount of solar energy received by the surface and the resultant temperature than on the kind of plants.³¹

Thus, by experiments with only a few types of plants, relating temperature and actual transpiration, a general formula could be devised by which potential evapotranspiration could be calculated.

When potential evapotranspiration is plotted against actual precipitation, then it is found that the two graphs are not in agreement. Excesses run off, or, if the area is not filled with moisture to "field capacity" (to a depth of 10 cm. for a loam soil), it soaks into the soil. A deficit of precipitation may for a time be made up by soil moisture reserves, but after these are exhausted, the plants suffer physiological drought.

In the Township of Puslinch, the average year sees soil moisture depleted by the last week in July. Plants continue to require more water than is available until the second week in September.

These calculations apply to a normal loam soil; they therefore would most closely approximate the conditions on the Guelph loam. But the Burford loam and the Dumfries loam of Puslinch have a very porous texture; they do not retain moisture as long as the normal loams. A water deficit occurs in August even for the latter; in the Puslinch

climate, the Burford and Dumfries soils suffer from a definite water deficit handicap. These soils, which cover more than two-thirds of Puslinch, must be treated with care; organic content especially must be kept high.

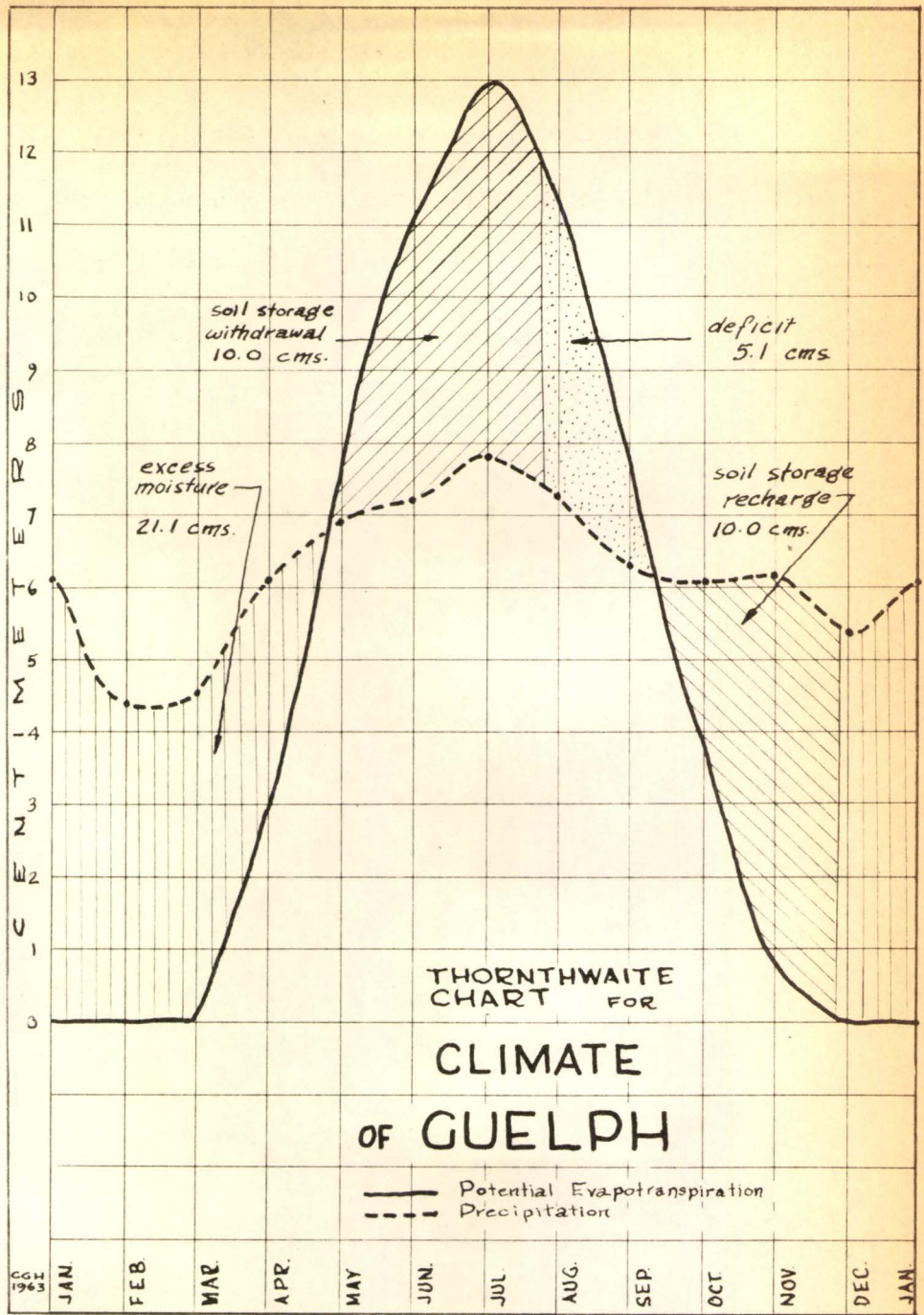


FIG. I-8

Table I-A

Thorntwaite's Scheme for

GUELPH, Ontario

| | J. | F. | M. | A. | M. | J. | J. | A. | S. | O. | N. | D. | Total |
|----------------------------|------|------|------|------|------|------|------|------|------|-----|-----|------|-------|
| Mean monthly temperature | -6.7 | -7.8 | -1.7 | 5.6 | 12.2 | 17.2 | 20.0 | 18.9 | 15.0 | 8.9 | 2.2 | -4.4 | |
| Precipitation | 6.1 | 4.4 | 4.5 | 6.1 | 6.9 | 7.2 | 7.8 | 7.3 | 6.3 | 6.1 | 6.2 | 5.4 | 74.3 |
| Potential evapotransp't'n. | 0 | 0 | 0 | 2.9 | 7.6 | 11.0 | 13.0 | 11.3 | 7.7 | 4.0 | 0.8 | 0 | 58.3 |
| Soil moisture in storage | 10.0 | 10.0 | 10.0 | 10.0 | 9.3 | 5.5 | 0.3 | 0 | 0 | 2.1 | 7.5 | 10.0 | |
| Moisture deficit | | | | | | | | 3.7 | 1.4 | | | | 5.1 |
| Runoff | 4.5 | 5.2 | 4.5 | 3.8 | 1.6 | | | | | | | 1.5 | 21.1 |

Annual water need: 58.3 cms.

Annual precipitation: 74.3 cms.

June, July August

precipitation: 35.3 cms.

summer ppt'n concentration: 60.5%

Thorntwaite Climatic Type: B B' r b'
1 1 2

Humid Mesothermal

"Koppen Climatic Type: Dfb

Humid Microthermal (warm summer)

8. Original Forest

Within the Township of Puslinch, we are most fortunate in having very complete records of the forest while practically untouched by man.

The early provincial surveyors were instructed:

Your field book is to be kept in the accompanying form, comprising the kind and quality of the soil and timber, entering each kind of timber in the order of its relative abundance.³²

Accordingly, a record was kept along every survey line in Puslinch (see Plate I-10). From these records it is clear that the township at the time supported a primeval forest -- not, however, without great variations in height and quality of timber. For example, on the front concession line of Concession XI, the surveyor recorded at Lot 26 "4 ch. of Basswood, Black Ash, Maple, and Elm; small timber; low, wet land", while on the front concession line of Concession V, he recorded at Lot 7 "15 ch. of Maple, Beech, Elm, Cedar, and Black Ash; very heavy timber; clay subsoil." I can find no physiographic relation to areas of heavy timber -- it was found on clayey, sandy, and gravelly subsoil, on well drained, and on poorly drained sites. But where small timber was recorded, the site is usually found to be poorly drained.

Worthy of mention are some small "hay meadows". An example was found on the front line of Concession XI at Lot 19:

At 11 ch. a creek 5 l. wide, 2 ft deep.
A hay meadow on each side of the creek. 3.50 ch.
of clear flat meadow, good hay ground. 6.5 ch.
of cedar and tamarack.

These appear to have been induced by a wet location. But the possibility

of early aberiginal clearing and burning should not be absolutely discounted without further study.

In very general terms, the dominant forest type was Sugar Maple, Beech, Basswood, while Eastern White Cedar occurred in large quantities on poorly drained lands. A graphic portrayal of forest and soil conditions along several concession lines is shown as fig. I-9.

It would appear that Puslinch, with its two lines of morainic hills, is an excellent example upon which to apply the forest type scheme of Hills (1960). He states that tree growth is dependant upon soil,³⁴ climate, saprobes, fauna, and man. We will consider saprobes and fauna to operate uniformly over all of the Township, while man had not been a disturbing factor when the original forest data was collected in 1828~~x~~ 1831. This leaves the physical factors of soil and climate to be considered; these are: (1) nutrient, (2) soil moisture, (3) soil aeration, (4) soil reaction, (5) composition of the soil air, and (6) soil structure. To classify land so that these factors are considered, Hills suggests that one first determine "landtype"³⁵ from the texture and mineral composition of the soil parent material. These landtypes are then subdivided into physiographic site types on the basis of hotter or colder ecoclimate (a south slope or a sheltered upland valley will be hotter; a north slope or a valley with poor air drainage will be colder), and on the basis of wetter or drier location (as determined by soil profile features.)

This scheme was arrived at by observing the changing continuum of forest types from South to North and from East to West in Ontario. The chart for the Lakes Simcoe-Rideau and Lakes Erie-Ontario regions is

set forth as Fig. I-10.

The Township of Puslinch falls near the southern border of the Lakes Simcoe-Rideau region. It appears from the map (Fig. I-10) that the Lakes Erie-Ontario region is contained within the lowlands of those lakes. Puslinch, therefore, though peripheral to the Lakes Simcoe-Rideau region, is much more a part of it than of the Lakes Erie-Ontario region due to an elevation of 950 to 1250 feet.

But when Hills' scheme is applied to Puslinch, the results correspond only as very broad generalizations. His chart states that upon fresh soils and a normal ecoclimate, the characteristic species will be Beech, Maple, Oak, and Hemlock. For other combinations of soil and ecoclimate, but still upon a soil with satisfactory drainage, one or more of these species remain common, while others are added to give a differing forest type.

Upon the well-drained sites Puslinch had a cover of Maple, Beech and Basswood, with some associated Hemlock, Elm and Pine. The Elm tends to come in more strongly where the drainage becomes impaired, whereas the Pine favours the areas of excessive drainage and/or light soils. But the Hemlock, and various less common intrusive species, seem to follow no distinguishable pattern; Hills, however, has a pattern closely worked out within the framework of soil moisture and ecoclimate (see Fig. I-10).

A careful analysis of original forest to soils relations was done along every second concession line within Puslinch. This is given as Appendix I-C and I-D. The conclusions reached are that within Puslinch

Township, the impaired-drainage sites were, in almost all cases, covered by Eastern White Cedar. Where the site tended to be colder, Spruce, Tamarack, and some Hemlock appeared with the Cedar. Where the wet site occurred upon the moraines, it was usually very small, and was covered by an extension of the adjacent drier site cover, or by various other species such as Elm or Black Ash. The following table summarizes the observed conditions:

Wetter than Normal Soils

| Ecoclimate | Warmer | Normal | Colder |
|------------|----------------|--------|-------------------------------------------------|
| Species | no large areas | Cedar | Cedar, with Spruce, Tamarack, and some Hemlock. |

Hills' scheme, by comparison, gives many more species, and certainly does not give emphasis to Cedar:

Hills Scheme -- Wetter than Normal Soils

| Ecoclimate | Warmer | Normal | Colder |
|------------|-----------------------------------------------|-------------------------------------------------|--------------------------------|
| Species | Maple - Yellow Birch - Walnut - Black Cherry. | Hemlock - Yellow Birch; Elm, Cedar, Balsam Fir. | Balsam Fir - Spruce; Tamarack. |

Our evaluation of Hills' Forest Site scheme within the Township of Puslinch, must be, then, that it does not yield the exactness for which it was put forth as an improvement upon earlier schemes.

It is ironic, then, that we must turn to the work of Halliday (1937) to find a close description of the original forest of Puslinch. With the exception of the omission of Tamarack from the species of the

poorly-drained areas, his description of the Great Lakes-St. Lawrence region coincides with the original survey data which I have analyzed and set forth in table I-B. I conclude, therefore, with a quotation from his work:

Sugar maple and beech are dominant, comprising about three-quarters of the forest. With them are basswood, white elm, yellow birch, white ash and some red maple, and (Northern) red, white and bur oak. Small groups of hemlock and balsam fir and an occasional white pine occur within the association, as well as a scattered distribution of large-toothed aspen, bitternut hickory, butternut, ironwood, and black cherry; and blue beech, silver maple, slippery and rock elm, and black ash are found locally on specialized sites such as river-bottoms and swamps.... White and red pine stands are found on lighter soils ... and Eastern White Cedar in swampy depressions. ³⁶

TABLE I-B

ORIGINAL FOREST COVER (1828, 1831) in TOWNSHIP of PUSLINCH

Well-drained sites, no exceptional ecoclimatic influence.

Hard Maple, Beech, Basswood; associated Hemlock, Elm, and
White Pine.

Sites upon the moraines, disturbed by unusual drainage.

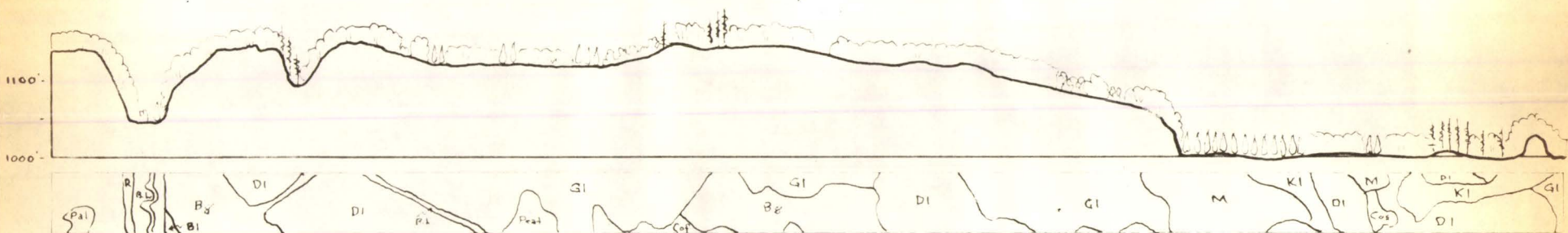
Same as well-drained sites, but

- (a) upon excessively-drained sites or sites with light soils, a tendency to White Pine.
- (b) upon small hollows of poor drainage, a tendency to Elm, Cedar, Black Ash.

Poorly or imperfectly-drained sites, on large, flat areas.

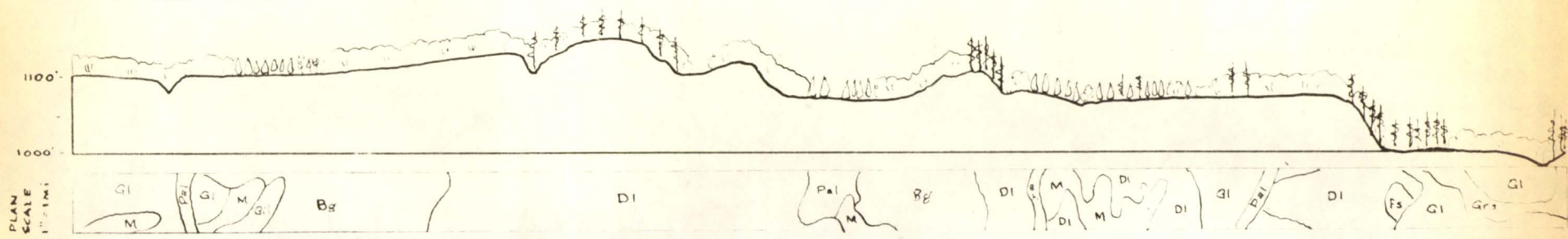
Normal Ecoclimate: Cedar

Colder Ecoclimate: Cedar, with tendency to Spruce,
Tamarack, and with some Hemlock.



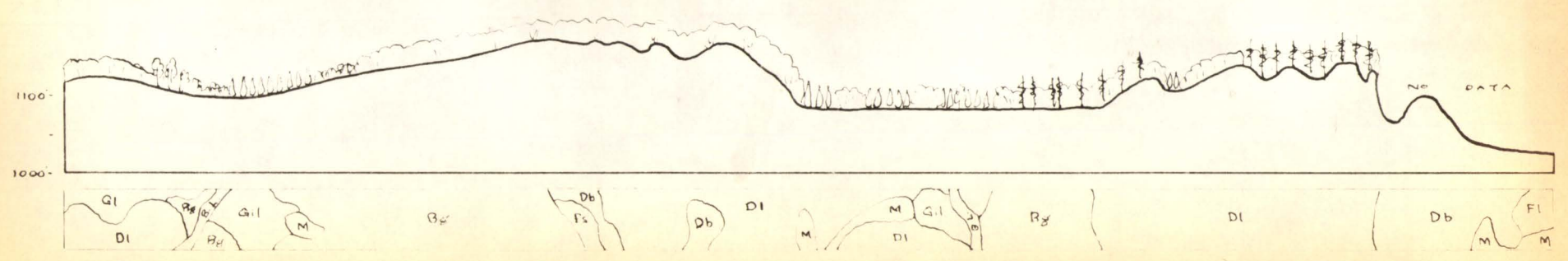
ALONG CONCESSION XI FRONT

- MAPLE-BEECH-BASSWOOD
- ELM-SOFT MAPLE-ASH
- CEDAR-TAMARACK
- PINE



ALONG CONCESSION IX FRONT

For soils legend see p.



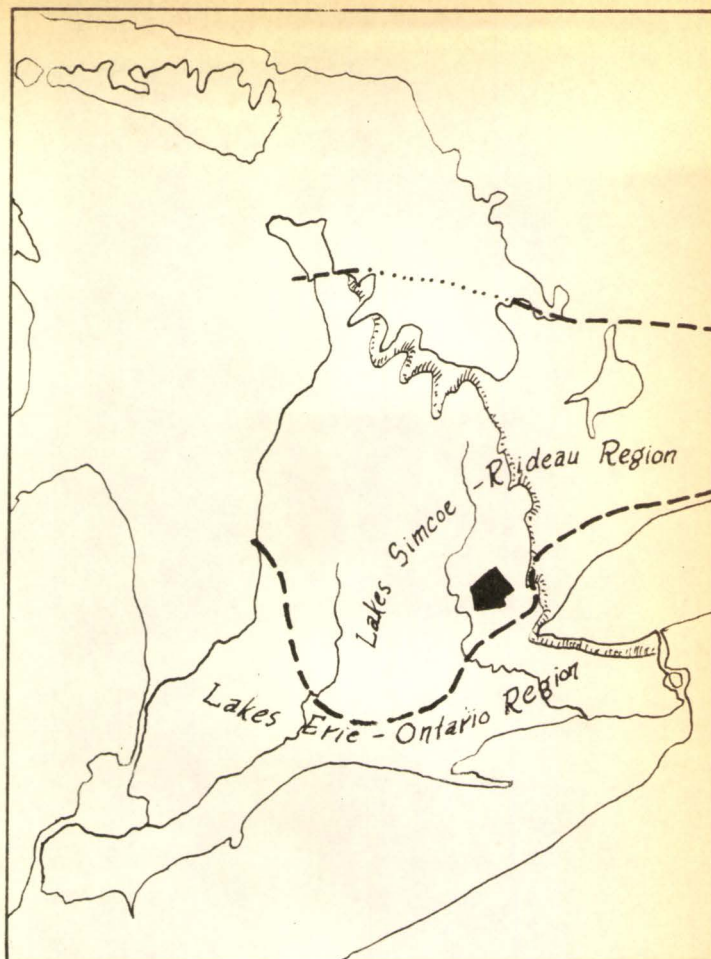
PLAN & PROFILE SHOWING SOILS AND FOREST (RESPECTIVELY) LOOKING N.E. ALONG CONCESSION VII FRONT

C.G.H. 1963

FIG. I-9

54

PLAN SCALE 1" = 1 MI.



CHARACTERISTIC FORESTS OF
MAJOR PHYSIOGRAPHIC SITE CLASSES for LAKES SIMCOE-RIDEAU REGION

| HOTTER | | | ECOCLIMATE NORMAL | | | COLDER | | |
|------------------------------------------------------------|-------------------------------------------|---------------------------------------------|-------------------------------------------|------------------------------------------|---------------------------------------------------------|------------------------------------------------|---------------------------------------|-----------------------------------------|
| SOIL | | | SOIL | | | SOIL | | |
| DRIER | FRESH | WETTER | DRIER | FRESH | WETTER | DRIER | FRESH | WETTER |
| ^A Beech- ^E Hemlock | ^{W.E.} ^{Sh} Oak-Hickory | ^{H.S.R.} ^{Y.} Maple-Birch | ^{H.R.} ^{W.R.} Maple-Oak | ^A Beech- ^{H.} Maple | ^{E.} Hemlock- ^{Y.} Birch | ^{W.R.} Pine | ^W Spruce- ^B Fir | ^B Fir- ^{BW.} Spruce |
| ² Oak- ^{S.R.} Elm (Poplar, Juniper) | (^R Elm, Butternut) | - ^{B.} Walnut-Cherry | - ^W Ash- ^A Elm | - ^R Oak- ^E Hemlock | ^{AS} Elm, ^W Cedar, ^B Fir | ^W Ash- ^{AR} Elm (Cedar) | | ^A Larch |

FIG. I-10
HILLS'
FOREST TYPE SCHEME

G.A. HILLS. "Regional Site Research,"
The Forestry Chronicle
DECEMBER, 1960, Vol. 36, No. 4.

APPENDIX I-C

Landtypes - according to Hills' scheme

| <u>Texture</u> | <u>Mineral Composition</u> | <u>Soil Catena</u> | <u>Wetter Soil</u> |
|----------------------------------------|----------------------------|------------------------|---------------------------------------|
| <u>Landtype A</u> | | | |
| loam | calcareous | Dumfries Guelph | Killean Lily London Parkhill |
| <u>Landtype B</u> | | | |
| sand | calcareous | Fox | Granby |
| <u>Landtype C</u> | | | |
| fine sandy loam and silt loam | calcareous | Brant | Colwood |
| <u>Landtype D</u> | | | |
| Gravel | calcareous | Burford Donneybrook | Brisbane Gilford Donneybrook |

APPENDIX I-D

Forests found on wetter physiographic site types

| | <u>Ecoclimate of physiographic site</u> | | | | | |
|-------------------|-----------------------------------------|---|----------|---|--------|---|
| | Warmer | | Normal | | Colder | |
| <u>Landtype A</u> | M B Bs | 2 | H M B Bs | 1 | C | 1 |
| | T | 1 | M B Bs | 1 | M B Bs | 1 |
| | | | E M | 1 | C | 1 |
| | | | M B Bs | 1 | Hay | |
| | | | T | 1 | mead. | 1 |
| | | | BlAsh | 1 | | |
| | | | M B Bs | 1 | | |
| | | | M B Bs | 1 | | |
| | | | M B Pine | 1 | | |
| | | | | | | |
| <u>Landtype B</u> | | | M B Bs | 1 | | |
| | | | | | | |
| <u>Landtype C</u> | | | C | 1 | | |
| | | | T Pop. | 1 | | |
| | | | | | | |
| <u>Landtype D</u> | | | C | 1 | C | 2 |
| | | | C | 3 | | |
| | | | | | | |
| <u>Landtype E</u> | | | H C | 1 | S T | 3 |
| (Muck) | | | C | 3 | CH | 2 |
| | | | C S T | 1 | C | 2 |
| | | | C | 1 | C | 1 |
| | | | C | 1 | CT | 1 |
| | | | C | 1 | C | 1 |
| | | | C | 1 | | |

NOTES

Abbreviations of species:

H: Hemlock; M: Maple; B: Beech; Bs: Basswood;
 E: Elm; T: Tamarack (Larch); BlAsh: Black Ash;
 C: Cedar; Pop: Poplar.

The digit following the forest occurrences refers to the size of the area found on a survey line:

1 means a small area, 2 means a moderate area, 3 means a large area.

The field notes of
David Gibson along the
front line of the
Tenth Concession of
Puslinch.

1 Con. East of Centre Road

Lot No 1

20.00 Bush, Maple, & ~~Aspen~~ ^{Hardwood}
Thick of Black Mott
clay subsoil, good dry
Land descends to the
Eastward

Lot No 2

20.00 This is the same qual-
ity of land & timber as
No 1. at 920 a small
run to the Eastward

Lot No 3

at 650 a small Pond, the
left about 2 chains

23.50 Land & timber as No 1
at 1850 a small creek
runs eastward

24.00 Cedar along the banks of creek

25.50 Maple, Birch, Elm & ~~Aspen~~ ^{Hardwood}

27.00 Flat land

"Your field book is to be kept in the accompanying form, comprising the kind and quality of the soil and timber, entering each kind of timber in the order of its relative abundance."

9. Natural Regions

Since physiography, forest, and soils are interrelated, and since soils are the product of physiography, forest, and climate (which can be considered constant over Puslinch), it is logical that the soils map should supply the base for the subdivision of Puslinch into natural regions.

The soils map though, should show the same outline of groups of catenas as the Pleistocene geology map shows of parent material (e.g. Dumfries and Guelph catenas together should occupy the same area as Wentworth Till). The boundaries shown on the two maps, however, do not agree in detail -- though the general regions are remarkably similar, considering that they were both done independently.³⁷

I have chosen to use the soils map -- not because I believe it more accurate, but because soils are the link between the physical and the human (i.e. between land and man). These regions can then be used later for comparisons with land use, and, if such exist, with geographic regions.

The Map I-11 delineates these regions; their description follows.

(a) Downey/Arkell Drumlin and Outwash Plain Complex

This area is composed of long, low drumlins interlaced by almost flat outwash gravels. Interdrumlin swales show some poor drainage, but the outwash gravels are generally well-drained. The soils

are the Guelph loam on the drumlins, and the Burford loam on the outwash gravels. Bedrock occurs only in the valleys of the Eramosa River in the east, and the River Speed in the west.

The natural vegetation of this region was Maple, Beech and Basswood, with Cedar and Tamarack in the poorly-drained depressions.

This region was well-endowed with organic material in the soil, but not with other soil minerals except lime. It will, however, respond well to commercial fertilization.

(b) Paris and Galt Moraines

These are high and bulky ridges of stoney and sandy till. Much of the topography is steeply rolling and of the basin form. The soils are mostly the Dumfries loam, but large areas of Donnybrook sandy loam have developed on kame. Some soils developed from sand are found in the west of the township.

The natural vegetation was Maple, Beech and Basswood; Pine was common on the sandier and drier areas.

The land of this region is inherently low in organic material and in all minerals except lime. It gives only fair response to commercial fertilizer; its greatest need while cultivated is manure.

(c) Aberfoyle Outwash Plain

This region is an almost flat outwash gravel plain. The soil developed over most of its area is Burford loam, but large poorly-drained depressions have been filled with organic material, due to drainage being inhibited by underlying marl.

The well-drained sections carried a natural vegetation of Maple, Beech and Basswood, while the poorly-drained depressions had a cover of Cedar or Tamarack.

(d) Corwhin Moraine/Outwash Complex

This is an area of parts of moraine, of kame, and of small spillways and their associated outwash. The small areas of outwash can be made productive with attention. The areas of moraine and of kame have similar characteristics as Region (b). The natural vegetation on this region varied greatly, according to the many differences in drainage.

(e) Badenoch Drumlin Field

The southern half of this field is composed of small, but high, drumlins resting directly upon Lockport dolomite. The northern half is more of a drumlinized moraine, and blends almost unnoticeably into the Galt Moraine. The predominant soil is the Guelph loam, but considerable areas of Brisbane loam, Granby sandy loam, Killeen and Dumfries loam also occur.

Topography varies from rolling in the north, to steeply sloping in the south. Drainage varies from good on the drumlins to poor in the interdrumlin swales. Extensive swamps occur where a combination of large interdrumlin swales and bedrock synclines correspond.

The natural vegetation of this region was Maple, Beech, and Basswood, with Cedar and Tamarack in the swales.

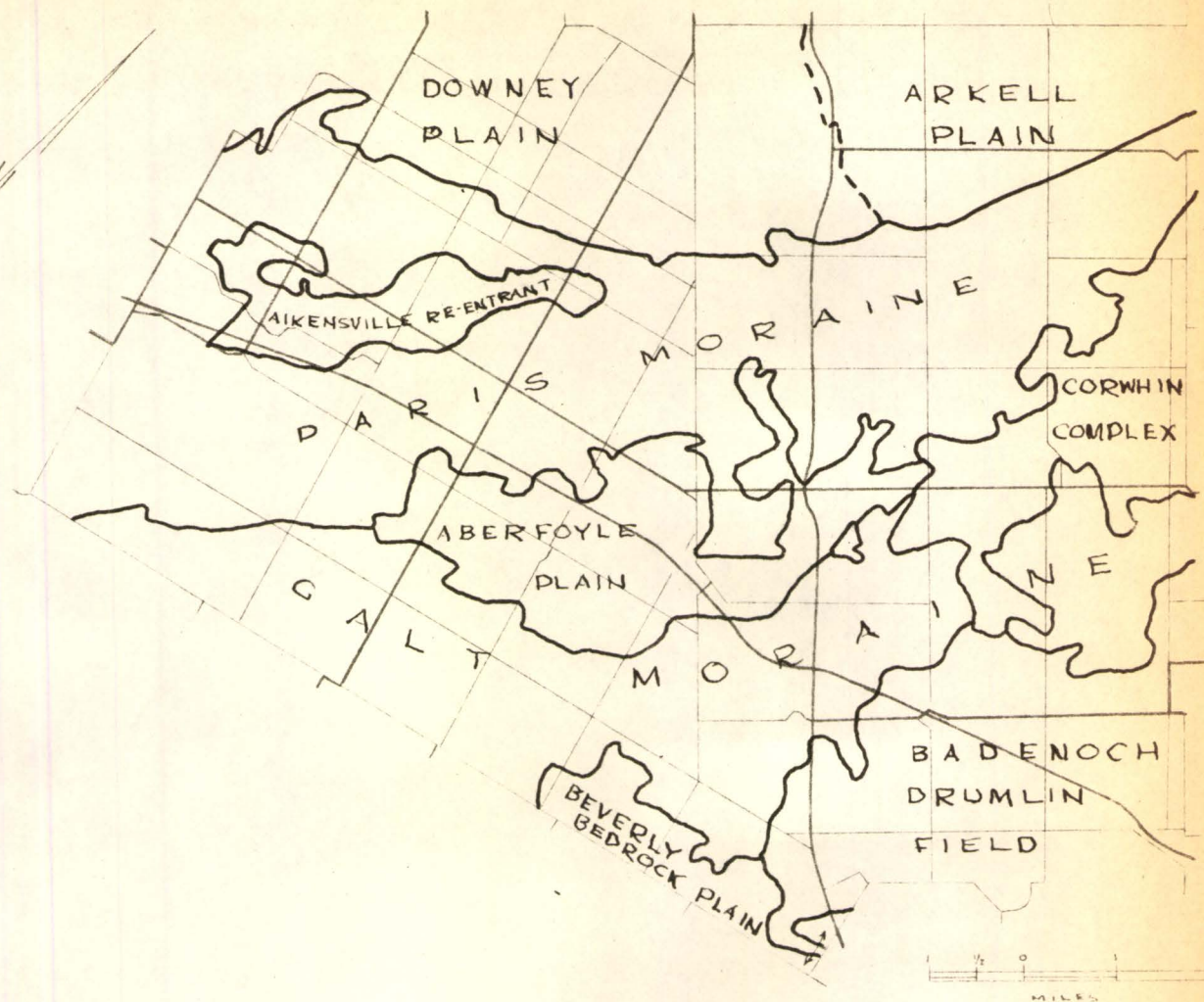
The region has a high inherent fertility, and responds well to commercial fertilization. Conservation practices should be applied when the steeper slopes are in agricultural use.

(f) Beverley Bedrock Plain

This is an area in which the Guelph dolomite forms the surface, or is only thinly mantled by outwash deposits. The soils are shallow, and are mostly Farmington loam; members of the Burford catena have developed on the outwash.

Drainage in the region varies from excessive on the Farmington loam areas to poor on the outwash.

The region is useless for agriculture. Quarries and recreation are its best uses.



TOWNSHIP OF PUSLINCH
NATURAL REGIONS

MAP I-11

FOOTNOTES to BOOK ONE

- 1 P.F. Karrow, Pleistocene Geologist, Ontario Dept. of Mines, Toronto. Interview with the writer, Oct. 1962. Little is yet known of this valley.
- 2 L.J. Chapman and D.F. Putnam, "The Moraines of Southern Ontario", Trans. Royal Society of Canada, 37, Sec. 4, 1943, p. 37.
- 3 J.K. Charlesworth, The Quaternary Era, Edward Arnold (Publishers) Ltd., London, 1957, p. 416.
- 4 This author was a member of the engineering survey party as Highway No. 401 was built through this area. The example cited is found at the intersection of Highway No. 401 and road bet. Lots 15 & 16.
- 6 According to the Wentworth Scale.
- 7 P.F. Karrow, interview as Footnote 1.
- 8 D.F. Putnam and L.J. Chapman, "The Drumlins of Southern Ontario", Trans. Royal Society of Canada, 37, Sec. 4, 1943, p. 81.
- 9 See Footnote 4.
- 10 L.J. Chapman and D.F. Putnam, The Physiography of Southern Ontario, University of Toronto Press, Toronto, 1951, map, p. 29.
- 11 P.F. Karrow, interview as in Footnote 1; see also P.F. Karrow, Pleistocene Geology of the Galt Map-Area, Geol. Circ. No. 9, Ontario Dept. of Mines, Toronto, 1961, p. 5.
- 12 L.J. Chapman and D.F. Putnam, Physiography, p. 26, p. 48.
- 13 Ibid, p. 30.

- 14 L.J. Chapman and D.F. Putnam, "The Recession of the Wisconsin Glacier in Southern Ontario", Trans. Royal Society of Canada, 43, Sec. 4, 1949, p. 40.
- 15 Ibid, p. 38.
- 16 F.B. Taylor, "The Moraine Systems of Southwestern Ontario", Trans. Royal Can. Inst., 10, 1913, p. 59.
- 17 Putnam and Chapman, "Drumlins", 1943, p. 85.
- 18 P.F. Karrow, Pleistocene Geology of the Galt Map-Area, Geological Circular No. 9, Ontario Dept. of Mines, Toronto, 1961, p. 5.
- 19 Loc. cit.
- 20 Map, Geological Survey of Canada Publication No. 1877, 1920
- 21 David Gibson, Deputy Provincial Land Surveyor, Field Notes on file for Puslinch Township in Dept. of Lands and Forests, Toronto.
- 22 Much of the data in this chapter from Conservation Reports for Speed Valley, Spencer Creek, The Twelve-Mile Creek, Conservation Branch, Dept. of Lands and Forests, Toronto.
- 23 David Gibson Op. Cit. notes for lines betwn. Cons. III and IV, IV and V, V and VI, and X and XI.
- 24 Annals of Puslinch, 1850-1950, Acton Free Press, Acton, Ontario, 1950, p. 13.
- 25 J. S. Joffe, Pedology, Pedology Publications, N. B., N. J., 1949, p. 41.
- 26 Thornthwaite's Scheme; see Chapter 7, Climate.
27. Ontario Agricultural College, Guelph; cited in Soil Survey of Wellington County, as yet unpublished.
- 28 Ibid.

- 29 Climatic Summaries for Selected Meteorological Stations Vol 1, Met. Div., Dept. of Transport, Toronto.
- 30 L.G. Reeds, The Agricultural Geography of Southern Ontario, Ph. D. thesis, University of Toronto, 1955, p. 42.
- 31 C.W. Thornthwaite, "An Approach toward a Rational Classification of Climate", The Geographical Review, Vol. XXXVIII No. 1, 1948, p. 60.
- 32 Cited in Twelve Mile Creek Conservation Report, Department of Commerce and Development (now Dept. of Lands and Forests), Conservation Branch, Toronto, 1960, Forestry Section, p. 1.
- 33 Department of Lands and Forests, East Block, Queen's Park, Toronto, Maps and Surveys Section, Puslinch File.
- 34 Hills does not mean here the geographer's "soil"; he defines it as the "complex of features which constitute the rooting zone of forest trees", (Hills, 1960, p. 401.); this would be "parent material" to a geographer.
- 35 "Specific combinations of landform and climate"; (Hills, 1960, p. 411.)
- 36 W.E.D. Halliday, A forest Classification for Canada, Canada Dept. of Mines and Resources, Forest-Service Bulletin 89, 1937, p. 29.
- 37 The soil survey used Chapman and Putnam, Physiography of Southern Ontario as their guide; Karrow (Pleistocene Geology) had a M.S. copy of the soil survey map, but, he told this author, he used it only for reconnaissance.

BOOK TWO : MAN and LAND in HISTORY

1. Aboriginal Habitation

The Township of Puslinch presently offers scant evidence of aboriginal habitation. The Royal Ontario Museum files show only one small find, and the Department of Archaeology at University of Toronto feel that it is highly unlikely that this area was much inhabited prior to European settlement.

But, environmentally-speaking, some areas appear favourable for settlement. Hills of sand (for corn-growing and a dry village site) lie adjacent to large swampy tracts (the habitat of much game, even today), while springs or streams (for water supply) are never far away.

Two general locations would satisfy these requirements. The first is around Puslinch Lake, especially the south shore; the second is along the River Speed, especially on the hills to the east.

Now, a local historian records that around 1900, "it was quite a common thing on a Sunday in the spring to see three or four men, walking slowly in line with their heads down, backwards and forwards across a plowed field"¹. They were collecting Indian artifacts, mostly around Puslinch Lake. These finds included arrow heads, skinning knives, scrapers, drills, axes, beads, and bits of pottery. Many other scattered finds have been made along the River Speed, and some of the artifacts have been identified as Algonkin, dating to near 1200 A.D. This same historian gives an interesting argument to show that the Puslinch Lake site antedates 1650 "perhaps by many centuries", that it was an

outpost of the famous Westover site, and that the trails running northwest and southeast from Puslinch Lake (which were recorded by the original land surveyor) were part of a main corridor from Lake Ontario to the River Grand.²

The artifacts mentioned above are now unfortunately scattered, and the author was unable to locate them during the time of his investigations.³ It is understood that rimsherds are included, so that a dating of the site may be possible.

Far from being sterile of habitation, it may be found that the Puslinch area will offer much material for archaeological interpretation, and that it presently has merely escaped professional attention.

It is significant, too, that the areas cited as being most suitable for aboriginal habitation are, in fact, the areas where known past finds have been made.

2. A Township in the Woods.

The birth of the Township of Puslinch is an excellent reflection of the early surveys, politics, and religion of the Province of Upper Canada.

The first survey in the area took place in 1791, when a line was run to demarcate the lands which were to be deeded to the Six Nations Indians in 1794.⁴ The eastern boundary of these lands, six miles more or less from the River Grand, was to form the western boundary of the Township of Puslinch.

In the year 1792, a line was run from the present site of Burlington to the present site of Arthur, in order to locate the headwaters of the River Grand. This line formed the eastern boundary of a purchase from the Mississauga Indians which was later to become the Gore District.⁵ This was to become too, the eastern boundary of the Township of Puslinch.

Now, a small portion of the Canada, or Constitutional, Act of 1791, was to provide a political and religious battleground for decades to come, and was to have important effects upon the area we study here. This was the portion from section 35 to section 42, which

allotted for the support and maintenance of a Protestant Clergy an area equal to one-seventh of all lands which might thereafter be granted by the king for settlement.⁶

A similar amount of land was to be set aside as Crown Reserve. These lots were not to be grouped together, but were to be intermingled with the unreserved land.

But as if these blocks of undeveloped land scattered through the townships -- hindering orderly development -- would not be enough, two mistakes in interpretation were made. First, the area set aside for each Reserve was one-sixth, rather than one-seventh of the land granted.⁷ Second, though the Act was specific in requiring reserves only with respect to lands granted after 1791, reserves were nevertheless also made for land granted prior to that date. Special circumstances thus occurred in Lincoln County: lands had already been granted, no reserves having been considered; no reserves were to be located along the route of Dundas street, since it was felt that they would hinder development; lastly, no reserves were wanted along the American border, for this area should be developed as quickly as possible to ward off attempts of seizure by the new Republic. Therefore, the Crown Reserves of certain townships were combined in a single large block, with the Clergy Reserves in a similar block, both of these being located "to the rear of the County". These Reserves later became respectively the Township of Guelph and the Township of Puslinch.⁸

The Clergy Reserve question became a thorn in the side of Politicians. Fiery debates ensued. For the Reserves were being held exclusively by the Church of England, and any rents from them were applied only to that Church. Other Churches demanded a share; politicians held that the reserves were retarding efficient settlement.

In 1825, John Galt and his Canada Land Company managed to wrest some of the Crown Reserves, including what is now the Township of Guelph, from the government. Had it not been for the fierce protests

of Bishop Strachan, the Township of Puslinch, a Clergy Reserve, would have been included.⁹

Thus, with the Canada Land Company, a settlement was established at Guelph in 1827.¹⁰ To the south, settlement was proceeding quickly inland from the "front" townships; Beverley Township, recorded 3,481 acres under cultivation in 1829.¹¹ To the west, Waterloo Township had a population of 800 in 1810; by 1830, this township was generally settled, with a population of approximately 2,200.¹² But still, in early 1827, the Clergy Reserve block remained an unbroken forest, while Upper Canada was soon to witness a gigantic wave of immigration.

However, in July of 1827, an act was passed authorizing the sale of some Clergy Reserve lots. The sales began in November of that year;¹³ the first Clergy Reserve lot to be sold in Upper Canada was one in Puslinch, fronting upon the first road allowance to be opened, the Aboukir Road.¹⁴

This road, running from Guelph to join with the older Brock Road south of the Puslinch border, was the Eighth Concession line, and was surveyed by David Gibson in 1827.¹⁵ In the next year, Gibson laid out the lines for Concessions VII, IX, X and XI, one and one-quarter miles apart, and run on a course of North 44° East. The lots, of two hundred acres between concessions, had a front of twenty chains; provision was made for a sideroad of one chain in width at every fifth lot.

In 1831, the same surveyor was instructed to complete the survey of this former Clergy Reserve block (see Plate 11). Accordingly, the "New", or "Western", survey was executed, using the eastern

Waterloo Township line (which had been surveyed in 1791 in connection with the Six Nations Indian grant) as a base. The front lines of concessions I to VI were run on a course of North 77 degrees 15' East, again at a distance of one and one-quarter miles apart. The division into lots and the provision for sideroads was similar to that of the "Old Survey".

Puslinch was laid out in what is known as single-front concessions; the lots were long and narrow, in contrast to the earlier method of "squarer" lots. This new method gave each settler a smaller portion of road allowance to clear, allowing faster opening of concession roads.

It was during the survey of what Gibson, in his notes, referred to as "the First Concession of Puslinch, or the Rear line of Beverly" that he found that these lines did not, in fact, coincide. A Gore existed, having an area of approximately 7,000 acres (Gore Concession - see map, p. 5). Much of this Gore was later granted in large blocks to military veterans, who, in many cases, had neither the inclination nor the resources to develop their holdings. Much of the Gore, therefore, remained in forest for many years.¹⁶

Mention should be made of the survey notes, made in 1828, and 1831. These are extremely interesting and useful, for they record original forest, soil, and topography. Even at this early date it seems that the attributes of this land of Puslinch were well assessed. For instance, while running the front line of Concession IX, Gibson paused at Lot 10 to note:

From No. 1 to here the land is of a good quality and well adapted for cultivation with the exception of a swamp on Lot No. 5 Here [Lot 10] begins a great number of small hills. Soil very much mixed with gravel and stones. Vegetable mold is thinner than from No. 1 to this place.

The area "well adapted for cultivation" was the Arkell Plain, today the most prosperous area of Puslinch; the area from Lot 10 onwards is the Paris Moraine, much of which is now used only as pasture.

After completing the First Concession line, Gibson notes:

This concession line may be considered rather inferior land, the greater part of it is a light sand or gravelly subsoil, with a great many small Ponds of stagnant water standing in the hollows between the small hills.

Yet, it is interesting to note that Gibson registered one of these lots for himself,¹⁷ and that he recommended some of them to a friend in Toronto, Neil McPhatter. McPhatter actually journeyed to Puslinch to view the land, and returned the following year (1832) with a group of Scots to begin a settlement.¹⁸

Surveyors' descriptions, and even first-hand knowledge, then, seem not to have discouraged settlement on some of the poorest land in Upper Canada. This may be attributed to two reasons: first, to a Highland Scot, this land which we consider poor must have seemed excellent, when he recalled the rocks and heath that he had left; second, the fact that Puslinch was held wild as a Clergy Reserve until settlement pressed at its borders, meant that it was almost completely settled within ten years. The early settler who realized the faults of his land after a few years' occupation did not have the opportunity to move to a better lot nearby; he must either pull up his roots completely and move to a new frontier, or be content to live with difficult plowing, low yields, and problems of erosion.



Above, one of the earliest survey lines in Upper Canada later became the eastern boundary of the Township of Puslinch.

But it was not until almost forty years later that this former Clergy Reserve for the County of Lincoln was completely surveyed and opened for settlement.

Field Notes of the Township of Puslinch being the Clergy Reserve for the County of Lincoln

Surveyed in 1835 pursuant to Instructions from the Surveyor General's Office bearing date 14th June 1835 by David Gibson Deputy Surveyor

of William Chewett Esq. Acting Surveyor General for the County of York Upper Canada

3. The Settlers

From whence came these immigrants then, and where did they settle in Puslinch? Notes on the early period abound with mention of the Scots, the Irish, the English, and the Germans.¹⁹ The first census to make specific mention of Puslinch was that of 1851 (see Fig. II-4); if the native-born population are discounted, then the remainder are one half Scots, while the rest are one third English, one third Scots, and one third others, mostly Germans.

Settlement came in from the north along the Aboukir Road as soon as it was surveyed, in 1827. The Downey section saw settlers in the same year, a number of them having come in with John Galt to the Guelph area. In both these locations, the Irish were prominent.²⁰

The southern portion of the township received its earliest settlers in 1828, but they were few and scattered.²¹

In subsequent years, especially in 1831 and 1832, floods of settlers poured in. It was during this time that "ethnic" communities were set up. The Irish continued to be prominent in the north-west of the township. The south-west area along the stoney Galt Moraine was a predominantly Scottish community, begun by Neil McPhatter and his group in 1832. The same year, five families settled in the Badenoch area, having come to Puslinch from Scotland via Glengarry and Galt.²²

"The Hills" south of the present Arkell were settled by Scots,²³ while the farm lots along the Aboukir Road near the present Morriston

were taken by Germans, some from New York State, but more from Southern Germany.²⁴

Perhaps the most interesting is the settlement in the northern corner of the township begun by John Arkell in 1831. Arkell was desirous of setting up an English community in Upper Canada. Eighteen hundred acres were specially surveyed on the plains which now bear his name. Lots were laid out at right angles to the original survey, so that, it is said, the settlers could have access to the main northeast-southwest road.²⁵ The townsite of Farnham was plotted on Concession IX, Lot 6; the streets were laid out in a rectangle, with the town lots fronting these streets, and with a common in the village centre.²⁶

But for some reason the community did not find its centre here. Instead, the focus grew at the crossroads, one mile to the east, and gained the name of Arkell. Today, only the cemetery and the unusual street layout mark the site of Farnham.

Why did the town fail to prosper? Limited research has not yielded an answer. However, some possibilities may be cited: (a) the overpowering influence of the township grid-survey system (the easiest road down from the settlement in the hills crossed the main northeast-southwest road at the site of Arkell); (b) the unsuitability for Upper Canada of the village form (the separate farmstead settlement is the popular rural type in this area); (c) human factors (the church was erected on the Arkell site in 1839, on land that had been donated); (d) financial reasons (the price of town lots may have been exorbitant).

The early settlement can be ethnically related to land types. The

The Irish settled on the Downey Plain, with its Guelph loam on the low drumlins and Burford loam on the flat outwash. The English obtained large lots on the Arkell Plain, which is similar to the Downey Plain. The Germans were concentrated mostly about the present site of Morriston, on "better" parts of the Galt Moraine. The Scots knowingly (in some cases, at least) chose the sandy and gravelly Galt and Paris Moraines. These locations, though, had less danger of frost in the Fall, and warmed up earlier in the spring. Poor drainage was an almost insurmountable obstacle in the early days, so that a well-drained site (even to the extent of being excessively-drained) would be considered an advantage. Scots also chose farms in the Badenoch Drumlin Field, a far better location as far as inherent soil fertility was concerned, but one which had the problems of erosion and poor drainage.

And so the rural settlement of Puslinch was begun. By the early 1840's, little land was left untaken. This more than sixty-thousand acres was no longer the wilderness Clergy Reserve for the County of Lincoln; it was the Township of Puslinch, resounding to the thud of the axe.

4. Preface to the Periods

The historical geography of Puslinch after the first European settlement falls naturally into periods. These are referred to as Early, Middle, and Late; Middle and Late Periods are each subdivided. The basic criteria for the period divisions were census data on population and agriculture; house types and improvements in transportation corresponded. As research found other data, these were found to fall naturally and characteristically into the periods.

The periods, therefore, are not purely agriculturally defined; such names as the "Cash Grain Era", and the "Period of Livestock" are not fitting. But since house types are what we can see today as characteristic of the periods, an archaeological/architectural nomenclature is appropriate; it is concise and comprehensive.

But though the historical geography of Puslinch can be conveniently divided into periods, it can not be precisely done so, as with a knife. Rather, there is a transition from one period to the next. When change is controlled by outside economic conditions, though, it is relatively rapid; the transitions in Puslinch last less than five years.

In the following study, the Periods are not defined by dates, but it is helpful if they are kept in mind. Thus, a working classification can be:

| | |
|--------------|--------------|
| Early Period | 1830 to 1846 |
| Middle I | 1846 to 1861 |

| | |
|-----------|--------------|
| Middle II | 1861 to 1891 |
| Late I | 1891 to 1931 |
| Late II | 1931 to 1951 |

The census statistics for Puslinch are presented as graphs at the end of Book II. These are meant to be steadily consulted as the reader peruses the text, but the reader's attention will not hereafter be called to them. Certain graphs, maps, and charts that deal only with a specific Period are presented at the end of the text for that Period.

5. The Early Period

The Early Period was one of settlement, of the clearing of forest, and of the building of the rough log house or "shanty". Population grew quickly as the pioneers moved in and as natural increase began. In 1829, the township could boast of only 126 souls,²⁷ but by 1837, there were 1139.²⁸ The year 1841 saw a population of 1860,²⁹ while by 1851 this figure had risen to 3361.³⁰ The number of acres under cultivation had risen by 1845 to 13,140, and by 1848, to 19,913.³¹

Communications in this period were poor. A blazed line through the "sullen"³² forest was the most common route as the pioneer took his grain, the sack on his back, to the mill.³³ There were a few "roads", however, even in the 1830's (see Map II-2). The most important of these was the Aboukir Road, cut as a communication from the new town of Guelph to Dundas in 1828. An interesting comment upon the condition of this road is supplied by a traveller from Dundas in 1834:

....I started in the stage (a common lumber waggon) for Guelph, and an awful shaking we got. One of the passengers put a bottle of whiskey in the pocket of his swallow-tail coat, but, alas, it was smashed before we had gone a mile.... The travelling through the pine woods then was bump against a stump or the big roots, and then thump into a hole, with a pleasing variety of little steep gravel and sandy knolls now and then, especially after getting into Puslinch.³⁴

This traveller resolved that it was far more comfortable to walk, and would never travel that road by waggon again.

It is likely that there was also an early road from the Aboukir Road to Arkell and "points east", for the lots in the Arkell district

were laid out so as to "give early settlers access to the main road".³⁵

Another important road in the early days was the waggon road cut by the contractor building the Aboukir Road, so that he could bring in supplies directly from Waterloo. The pioneers of the Aberfoyle district used this road to take their wheat to Shade's Mills in Galt for grinding, there being "as yet no mill in operation at Guelph".³⁶

The original survey of 1828 notes a "sleigh road" at Lot 25 on the Ninth Concession line; mention is made later that the "road connecting with Nassagaweya was through Lot 27, Con. X".³⁷ This was likely the same road, and was probably the connection to the east from the Aboukir Road near Aberfoyle.

The Accommodation Road, in the western portion of the township was also cut through early. It was a given road, and deviated from the original survey since the lines for the second and third concessions presented difficult hills and swamps.³⁸

In this Early Period industry and commerce were carried on in the settlers' homes. No urbanization had occurred, possibly because of poor roads.

The farmsteads of this period were a mixture of forestry and agricultural pursuits. As noted in the description of original forest in Book I, the township was covered with a thick, virgin woodland. It is to their credit that the pioneers of Puslinch made full use of this forest gift. Though settlers in other townships may have cleared the forest by burning, those in Puslinch burned only the tops and brush, after doing a thorough job of logging.³⁹ The Aboukir Road in the winter

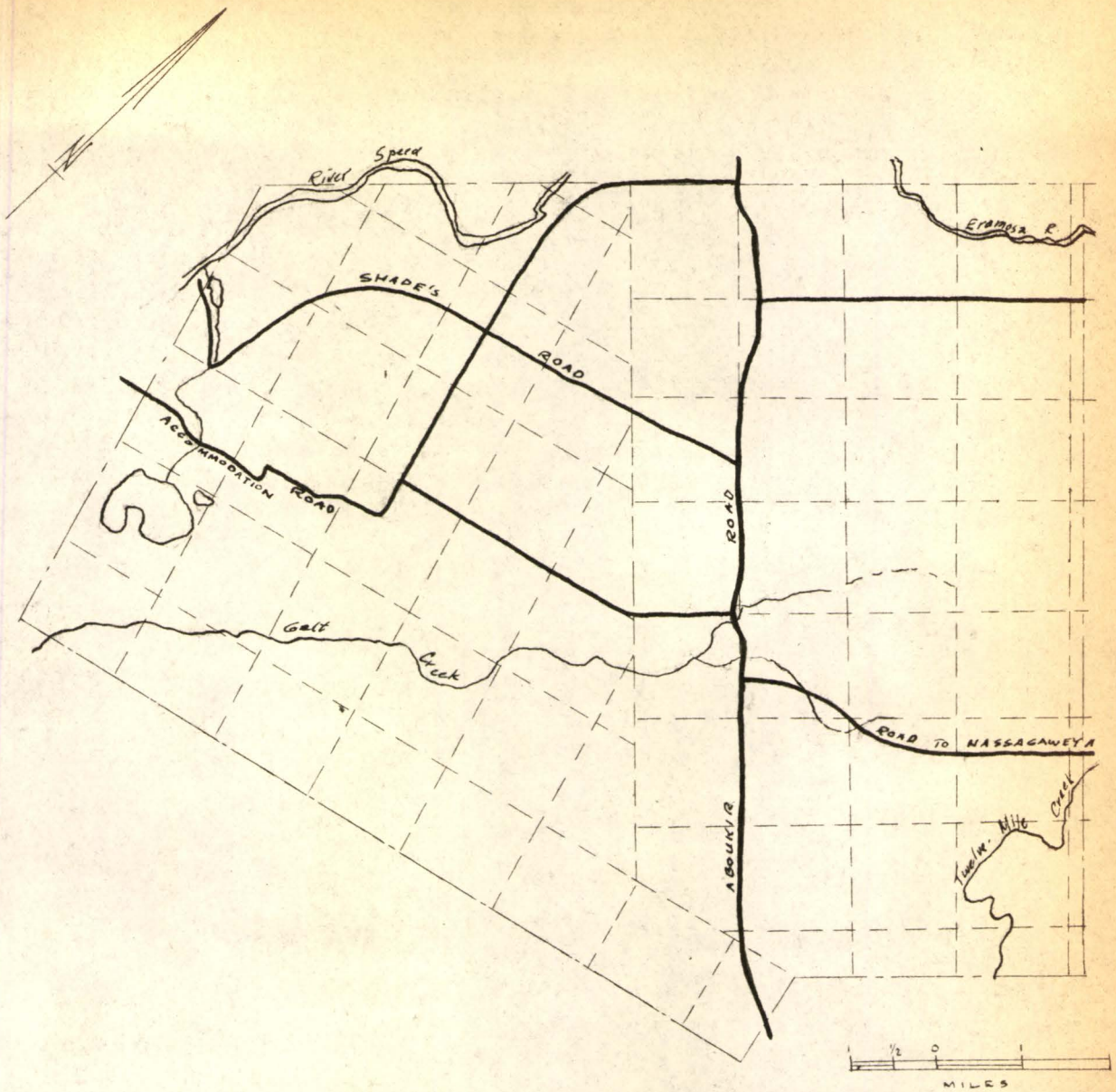
often saw a line of waggons a mile long, carrying wood to Guelph.⁴⁰ Even as late as 1880, Puslinch supplied cordwood to the Galt market.⁴¹

Laberiously, the land was cleared; the tops and brush were burned in heaps — and possibly the ashes were used for lye; potatoes were planted, and wheat was sown between the blackened stumps. The potatoes provided a staple food for the family, while the wheat was taken by foot to the mill in Galt, (or later, to Guelph or Dundas) to be exchanged for flour and other food and goods.⁴²

This was the extent of the agriculture over most of the township. Cattle were few; the few there were, were allowed to forage in the un-cleared forest. Little or no attention was given them in the winter. A true subsistence economy was being followed.

But notable exceptions were the Arkell and parts of the Downey Plains. These were parts of the high quality, gentlemanly farming established around the centre of Guelph. As early as 1833, a Puslinch Township gentleman imported large herds of Durham cattle, Southdown sheep, and Berkshire hogs; it is said that this was "the first importation of blooded stock into Canada".⁴³ These farms were cleared by hired labour, and were in a highly-developed state of cultivation while the farms on the moraines — many of them settled earlier — were still being won from the forest. Thus, even in the earliest days of settlement, two very different types of farming existed. Census data for the township as a whole combine these two types, and must therefore be employed with care.

But as this pioneer era drew to a close, even the moraine farms left the subsistence economy to enter the prosperous Puslinch of the Middle Period.



TOWNSHIP OF PUSLINCH
EARLY ROADS

No Major Settlements Known

FIG. II-2

INTERPRETED FROM
ANNALS OF PUSLINCH;
BREWSTER. LA RUE.

6. The Middle Period

In the Middle Period the Township of Puslinch looked outwards, to the great markets of The United States and the British Isles. Roads were improved, and small urban communities began to grow. Agriculture was a prosperous business; profits were invested in fine new homes, many of them of stone. The township boasted a population larger than it would support one hundred years later. Truly, these were the golden days of Puslinch.

Middle I Period

The opening of this period saw the continued rapid increase of population that had characterized the Early Period. The population in 1851 was 3862⁴⁴; by 1861 this figure had risen to 4701. Whereas 19,913 acres were under cultivation in 1848; the years 1851 and 1861 recorded 25,850 acres and 32,884 acres respectively. Area under crops increased from 14,409 in 1851 to 17,596 in 1861.

The numbers of cattle, and the acreage of hay and oats showed a considerable increase over the Early Period, but are proportionately not much greater, considering the increase in acreage under cultivation. Though American dealers were scouring the district of its cattle, the trade was likely largely limited to the breeders of the Arkell and Downey Plains. A cattle fair was first held at Guelph in 1852, but did not flourish until 1860.⁴⁵

Hogs were raised -- probably throughout the township -- in

moderate numbers right through this period. Their feed was principally peas, which became a profitable item of export during the Middle II Period; hog production therefore fell abruptly as pea exportation increased.⁴⁶

These years saw Puslinch populated with considerably more sheep than people. Canadian sheep had long been in demand in the United States; the Reciprocity Treaty strengthened the market, both for wool and mutton.⁴⁷ Puslinch, in 1851, produced almost 17,000 lbs. of wool — the highest production of any township in the county.

But most important, throughout the Middle I Period, was the growing of wheat. The trend could be noted even in the late years of the preceding period. After 1845 the potato blight forced an increase in wheat production for home consumption.⁴⁸ As well, wheat enjoyed a preference in the markets of Great Britain.⁴⁹ After 1848, it was sought by swarms of American buyers;⁵⁰ the Upper Canadian farmer "with better transportation facilities and a constantly expanding American market...began to look southward rather than overseas".⁵¹ In Puslinch, the Aboukir Road was gravelled, giving an efficient transportation link with the ports of Hamilton and Dundas.

But by 1853, the overseas export again increased as demands there swelled due to the Crimean War and to a wheat failure throughout Europe.⁵² The 1854 Reciprocity Treaty with the United States gave a full market to the south — so much so that the Canadian consumers were forced to import flour from the United States.⁵³

Wheat, then, was the principal cash crop of Puslinch. A report of the Agricultural Society of Puslinch in 1856 makes mention of a

"better quality of seeds...which will doubtless tend to establish the character of the township as one of the best wheat-growing districts of Canada West".⁵⁴

A similar report commented upon the cropping methods in 1852:

Fall wheat is sown upon summer fallow, or pea stubble; summer fallow produces the best crop, but pea stubble frequently produces the finest quality....Care is generally taken by the best farmers to avoid taking two white crops in succession off the same piece of land.

Upland grass is usually broken up about the third year, and wheat or peas sown upon the first furrow.⁵⁵

Manure was applied to summer fallow and then plowed in. This would probably be the only fertilization that the fields would receive. It is unlikely that lime was necessary, due to the high natural content of this mineral in the township's soils.

The agricultural report of 1852 makes a significant point of the varying attention given the land by different farmers:

A good farmer would consider 30 bu. of wheat, 30 of peas, 60 of oats, 35 of barley, about a fair average on his own farm; but it is quite probable that his next neighbour, in consequence of slovenly management, would not in the same season realize more than half that quantity.⁵⁶

A field poorly managed during this era would bear testimony a hundred years later.

So prosperous was the agriculture of the Middle I Period that, although the population was at an all-time high, an acute labour shortage existed.⁵⁷ Complex machinery was beginning to be used, but, though the early models did the work more quickly, they still required large amounts of labour. Lighter and better machines were to be a feature of the Middle II Period.⁵⁸

The prosperity of the period was interrupted in 1858, when "from all parts of Canada, we hear nothing but the same unvaried story of hard times, dull trade and scarcity of money"⁵⁹. The wheat midge too, had been advancing westward, but there is nothing to indicate that it had much of an effect upon Puslinch. But by 1860, the depression was at an end in Central and Western Upper Canada. For a short while the prosperity of wheat returned.

The Middle I Period saw improvements in transportation. Most important was the work done on the Aboukir Road. In 1848, there were complaints of great difficulty in reaching a market; but by 1852, this road had become

an excellent gravel road...which has given... ready access to the port of Hamilton, at all seasons; and has had the effect of reducing the cost of transport fully cent. per cent.⁶⁰

Smith, in 1851, notes the excellence of this road, "a great accommodation to the inhabitants of Guelph and the neighbourhood"⁶¹. In 1850, a passenger and mail coach service was established thereon; one coach a day each way left mail at Aberfoyle, Morryston, and Puslinch village.⁶²

Few hints are left as to the condition of other township roads at this time; it is likely that a good number had been cut out and presented fair roadways. An attempt -- based upon the scanty information available -- is made to show the geography of the township in the Middle I Period as Map II-3.

Improvements in transportation, fostered by and fostering prosperity, contributed to the rise of the urban communities. Prior to this, the urban functions were scattered throughout the township, located on

the farms of those who had the talents. To be sure, a few of these farms were clustered, but they could hardly be called urban communities. In the Middle I Period, urban clusters were characteristic, and their inhabitants were non-farmers⁶³ — an important point.

It can be noted on Map II-3 that many of the communities grew up on early roads. The old waggon road cut by the contractor building the original Aboukir Road has along its course a hotel, a blacksmith's shop and the hamlet of Strahn's Corners, with a hotel and a general store.⁶⁴ The old sleigh road from the Aboukir Road east to Nassagaweya has two saw mills and a blacksmith's shop. Were these roads then, still in use, cutting as they did across farms, and with no basis in law? It is an interesting question.

The two largest villages though were on the main Aboukir Road. At the present site of Aberfoyle, work was begun in 1831 to divert the Galt Creek and to build a dam, so that a mill could be constructed; it was not till the beginning of the Middle I Period, however, that this grist mill was completed. As early as 1843 a sawmill operated upon the site. After 1850, a tannery did an extensive business, but, like many of the early industries, it burned down. A general store and a number of hotels also operated in the district along the Aboukir Road, by this time thronging with teams.⁶⁵

Although Morriston had a small store, a tailor shop, and a blacksmith shop as early as 1844, it did not really begin as a village until the improvement of the Aboukir Road. In 1847 Mr. R. B. Morriston opened a store in the end of the blacksmith shop, and in 1849 commenced business in his own building. Shortly thereafter, the village witnessed a large

influx of European Germans, giving added impetus to the community. A post-office and hotel were opened in 1854; the year 1856 saw the erection of a sawmill, and, shortly after, the oatmeal and grist mills known as "Puslinch Mills". In 1861 these mills were destroyed by fire.⁶⁶

The township, in 1861, could boast of 726 dwellings. A report of 1852 states:

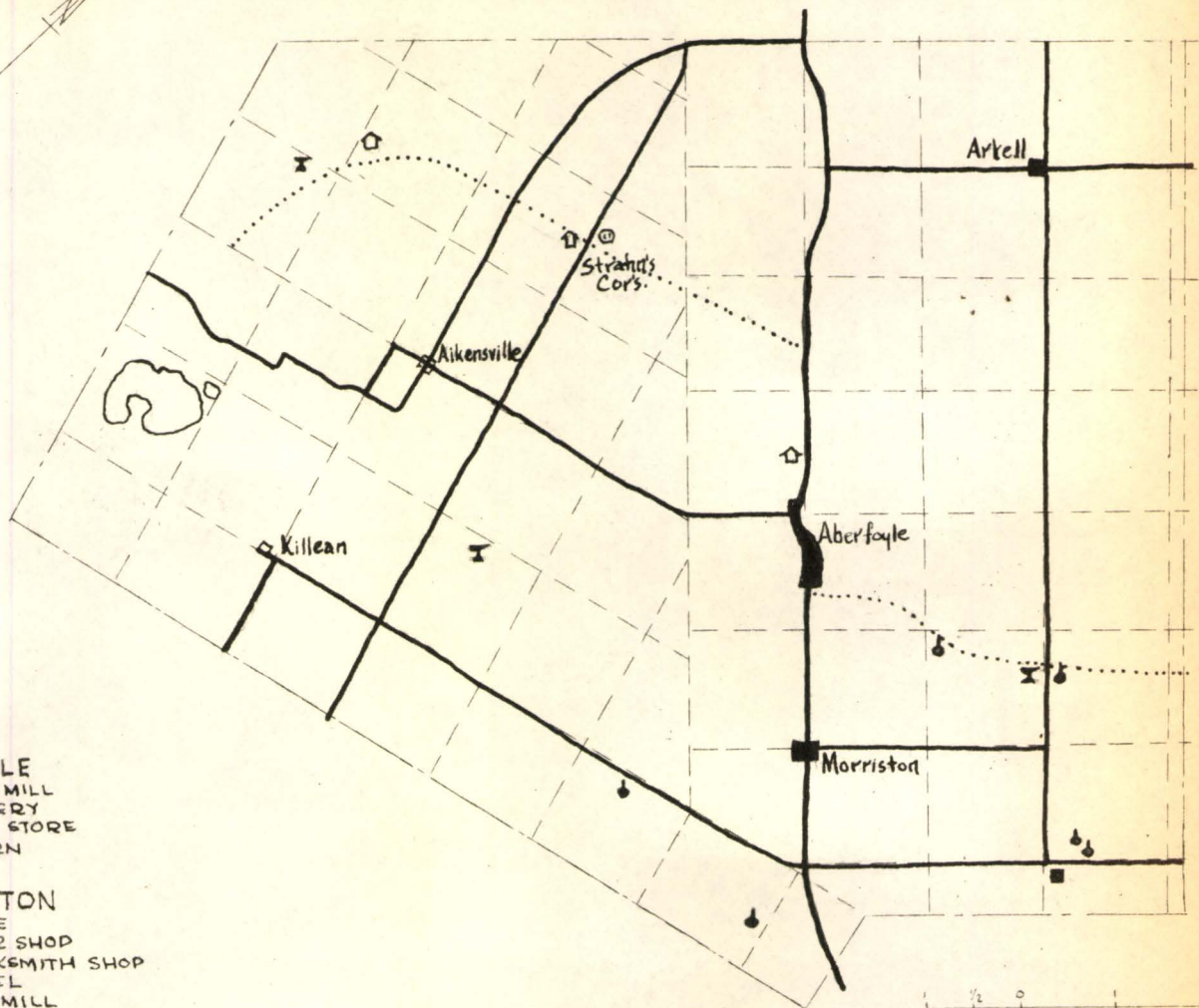
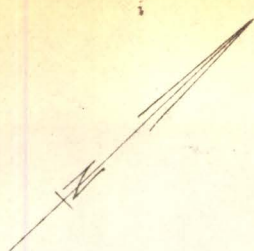
The buildings here were originally composed of unhewn logs but in the last five years immense improvements have taken place.... Log barns have disappeared.... Shanties are things which may be remembered by the old settlers, but it is long since they were replaced by comparatively comfortable wooden homes, and these houses are in their turn giving way to mansions composed of the more durable materials of brick or stone.⁶⁷

Although the log house was still by far the most common in the township, (see Fig. II-5), the dwelling which we can see today as characteristic of that period was of stone. This was a plain and heavy house, having a gentle-pitched roof with no dormers. The windows had a twelve-pane sash; porches were rare.⁶⁸ The dwellings of this period are among the most appealing in the township.

At the end of the Middle I Period then, Puslinch was a prosperous agrarian community. Wheat was its principal cash crop, but it also knew something of the raising of stock. Agricultural machinery had been introduced. Travel was no longer difficult, and the nuclei of many urban communities had been established.

The wheat-mining period of Puslinch had lasted for a little over a decade; the same period in the older townships to the east had lasted for thirty years, and their soils were "worn out". It was opportune that developments in the United States brought a diversifying of agricultural

endeavours; a more widespread interest in cattle was now becoming noticeable.



ABERFOYLE
 GRIST MILL
 TANNERY
 GEN'L STORE
 TAVERN

MORRISTON
 STORE
 TAILOR SHOP
 BLACKSMITH SHOP
 HOTEL
 SAW MILL
 OAT & GRIST MILL

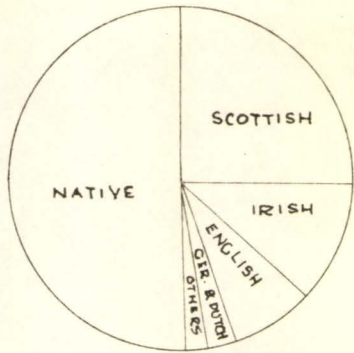
- ♣ SAW MILL
- ⌣ HOTEL, or TAVERN
- ⊙ GENERAL STORE
- ✂ BLACKSMITH SHOP
- CHARCOAL KILN

TOWNSHIP OF PUSLINCH MIDDLE I PERIOD

FIG. II-3

POPULATION

TOTAL 3862



TOTAL 4701

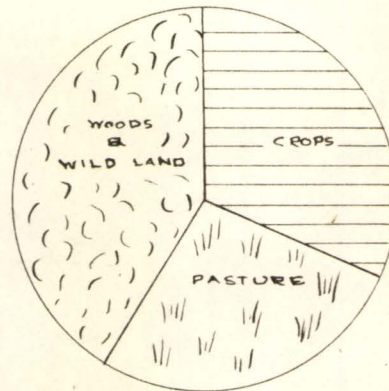
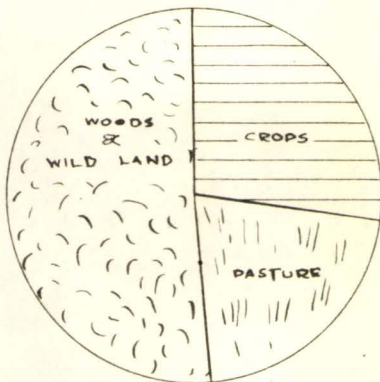


Canada Census
1851, 1861

1851

1861

CONDITION OF LAND

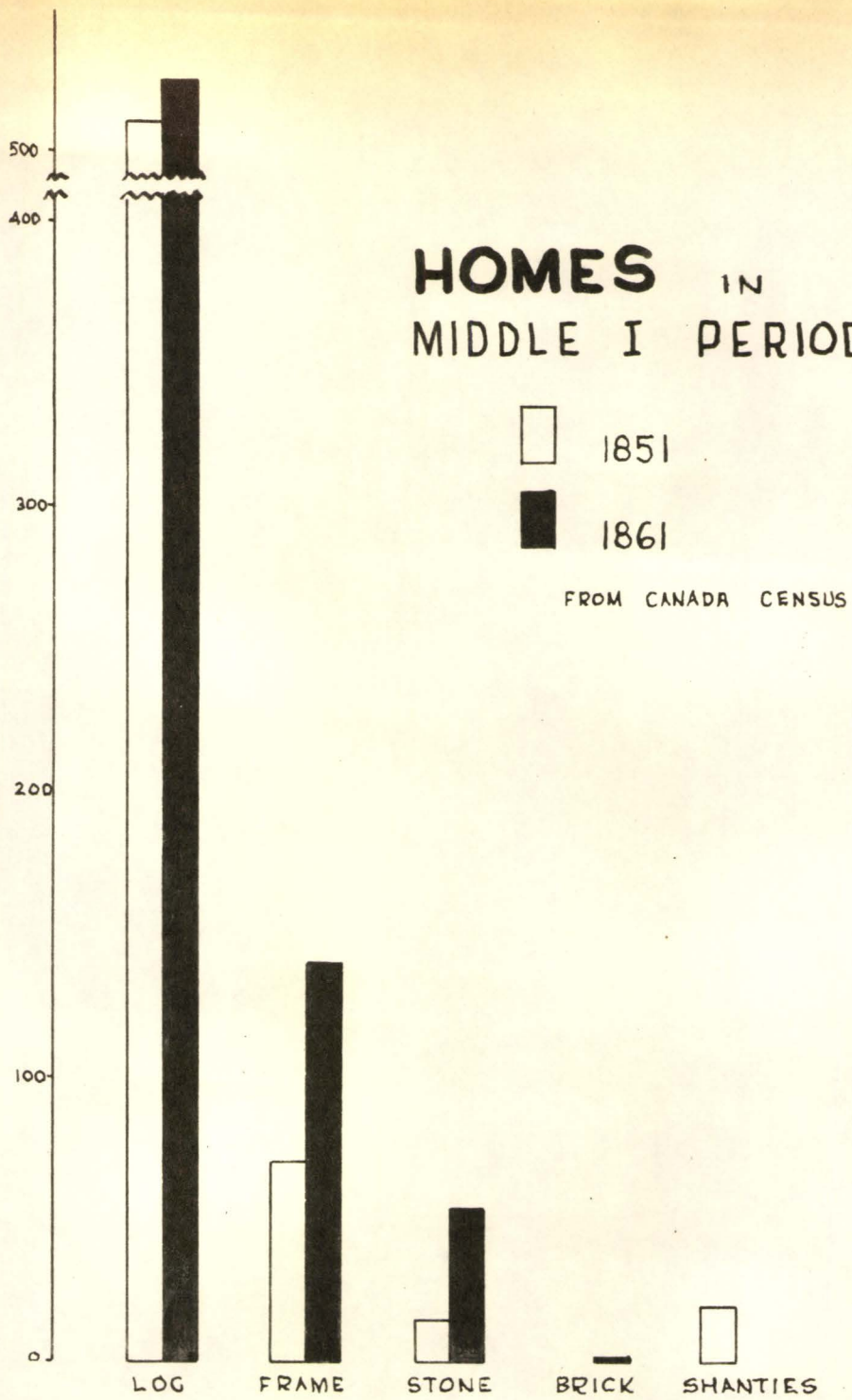


Canada Census
1851, 1861

FIG. II-4

MIDDLE I PERIOD
1846 - 1861

HOMES IN MIDDLE I PERIOD



Canada Census
1851, 1861

FIG. II-4



In 1852, "... log barns have disappeared..."
but, even today, the township retains a few examples.

Gore, Lot 8.

"... mansions composed of the more
durable materials of brick or stone."
A typical Middle I stone house.

Con. VII, Lot 13



7. Middle II Period

The export of cash crops continued; although wheat maintained some importance (until the Canadian West was opened in the 1880's), the production of peas and barley rose markedly.⁶⁹ Peas were in demand in Great Britain as seed, and in the United States as fodder for sheep.⁷⁰ In 1881, one-tenth of the township's cultivated acreage was in peas, giving them an importance equal to wheat, oats and hay. The production of barley gained at the expense of wheat.⁷¹ The Americans were now supplying their own markets with wheat from the western states, but they did not supply the four-rowed barley that their brewers demanded.⁷² Canadian barley gained the reputation for excellence that Canadian wheat was now ceding. Barley production in Puslinch climbed quickly, till by the 1880's approximately 3,000 acres were harvested each year. After 1890, however, an American tariff bumped Puslinch barley back down to insignificance.⁷³

That which really makes this period different from the preceding, though, is the emphasis upon livestock, especially cattle. At the beginning of the period, American buyers swarmed into Canada, taking horses, sheep, hogs and cattle.⁷⁴ The demand for sheep and hogs continued to the end of the Reciprocity Treaty. After that date, Puslinch production of these two animals fell off considerably.

All through the Middle II Period there was an American demand for Canadian horses;⁷⁵ the breeders of the Arkell Plains were only too

happy to supply their needs.⁷⁶ And, within Puslinch itself, larger cultivated acreages and the increased use of improved machinery required more horse power. The number of horses in the township increased steadily to a peak at the end of the period.

Perhaps most important though, was the blossoming of the cattle industry. Some increase in numbers of cattle over the previous period can be noticed within Puslinch. But more notable is the great increase in the acreage of oats and hay -- both crops closely tied to cattle production. The cattle breeds were being improved, and more attention was being given to their feed.

Now not only the breeders of the Arkell and Downey Plains used good grade stock; the ordinary farmers were forced into improvement by the British market. The farmer who stayed with common cattle "will be left to go a-begging to the local butcher to relieve him of his rubbish at the latter's own terms".⁷⁷

The improved cattle were Durham and Durham grades. The Agricultural Commission Report of 1881 informs us that in the Township of Puslinch, thoroughbred stock is introduced "to a considerable extent".⁷⁸ In fact, a Mr. Hobson states therein: "All the farmers in the South Riding of Wellington use thoroughbred stock animals at the present time."⁷⁹

The aforementioned report is valuable, for it occurs near the end of the Middle II Period -- a time when cash crop farming was waning, and when a mixed, or general, agriculture had taken hold. The type of farming then was to form a basis for the farming eighty years later.

In 1861, 32,884 acres had been cleared for cultivation; by 1891

this acreage had been increased to 46,754. After that date, the figure steadily decreased. Acreage in crops in 1891 had doubled from the 17,596 acres of 1861; conversely, woodland had decreased by more than half. These figures represent the farmer pushing his woodlot to the rear of the farm, then planting the increased land thus obtained in oats and hay for his cattle.

The number of farm operators remained relatively steady throughout the period. The total population, however, began a quick fall after 1861, decreasing from the 4701 of that year to 3614 in 1891. Labour-saving machinery reduced the need for a large family; the bright lights of the cities began to beckon the young; and after 1882, the "last, best, West" lured both the new immigrant and the Ontario farmer who wanted to start anew.

Near the end of the Middle II Period, the trend was to a general farm of 100 to 200 acres, with the farmer

raising just such crops as his soil seems best adapted for or his convenience demands, keeping his 15-20 head of stock and a few sheep and hogs, using the milk of his cows for the cheese factory or home dairy, and fattening two or three beasts annually for the market.^{eo}

And at this time the cities of Ontario were expanding rapidly, giving a local, rather than an export, market.

According to the Agricultural Commission Report of 1881, the farmers of Puslinch reported one-tenth of their land in each of fall wheat, oats, peas, hay, and pasture, and one-twentieth in each of barley and turnips. Seven-eighths of them used improved machinery (reapers, mowers, seed drills, sulky rakes, etc.). But "not many -- probably about one-tenth" used salt, superphosphate, lime, plaster, or other artificial

fertilizers. It was likely only the increased emphasis upon cattle and the diversity of crops that saved the soil for future generations.

Near the close of the Middle II era, the Agricultural Commission Report uttered wise words:

The time has come when farming, to be successful, must be carried on upon new methods and under new conditions. Adventitious advantages must be depended upon no more. Skill, energy, a readiness to avail of every new idea worth utilizing, are the only reliance of a sensible man....⁸¹

The report went on to advise the farmer of the necessity of improvement of stock "if he has not done it already"; the farmers of Puslinch, it would appear, had done this, thanks to the at-home influence of the best breeders of the country and the pressures of the overseas market.

The Middle I Period had seen village nuclei develop at cross-roads throughout the township. In the Middle II Period, with the help of improved transportation, and better horses and carriages, geographic selectivity either nourished or starved these sites.

In 1869 the village of Aberfoyle could boast of two shoemakers, two hotels, a butcher, a miller and a cabinet maker. A waggon and carriage shop flourished here during this era, making such things as waggons, buggies, sleighs, and many other kinds of smaller farm equipment.⁸²

By 1890, the village of Morryston had the imposing list of three hotels, three blacksmith's shops, two shoemakers, and one each of a tailor, weaver, brewer, and millinery shop. It also listed numerous stone masons, carpenters, framers and carriage-makers.⁸³

Even before 1880, the village of Puslinch could boast of two general stores and a hotel. With the coming of the Credit Valley

Railway in 1880 this centre gained considerable importance. The railway branch line to Hamilton (from Guelph Jct.) had not yet been constructed, so Puslinch became a terminus of the shuttle by team between the Credit Valley Railway and Hamilton. In the Late I Period it became a thriving railway hamlet.⁸⁴

In the Middle II Period, the use of other township roads was well developed. In 1862 a mail route was established from Puslinch via Crieff, Killean and Clyde (Beverly Township) to Galt. This was twice weekly till 1875, three times weekly from that date until 1877.⁸⁵

Crieff had had its beginnings in 1854, when a church was erected for the large Scottish farming community there on the Galt moraine. In the Middle II Period, the hamlet began its growth, gaining an hotel, two general stores, a shoemaker's and a blacksmith's shop. It also gained a reputation for a rather potent brand of local whiskey. The Sons of Temperance located a hall there in 1874, but within four years it was destroyed by fire.⁸⁶ While the Credit Valley Railway was being built through the township, the Crieff Hotel became the lodging for many of the workmen. It too, however, was destroyed in the fire of 1878.⁸⁷

Little is known of the activities of Arkell in the Middle II Period. Presumably, it continued as a service centre for the Arkell Plains. Within the Arkell area, a woolen mill and saw mill were erected, in 1869, on Lot 1, Con. 9; a grist mill was built, likely in the Middle II Period, on the Eramosa River (Lot 2, Con.9), on the site now known as Cook's Mills. There were two hotels in the area, one within Arkell, the other one mile west of the village.⁸⁸ The plains were crossed by the railway branch from

Guelph Junction to Guelph in 1888.

Puslinch Lake, by this time, had become a recreational centre of importance. By 1880, a fifty-passenger steamer was plying the lake, carrying passengers between the mainland and an hotel on the island. In 1885 the lake was a "popular summer resort", and it is said, a "well-paying proposition".⁸⁹

Thus the villages that could fulfill a specific function prospered. Aberfoyle, as well as being a local centre, was located at a crossroads on a busy highway, and offered a gristmill. Morriston was similarly located, and offered similar services, including specialties. Other communities provided specific services such as a teaming terminus at Puslinch and recreation at Puslinch Lake. Those hamlets that acted only as a local centre and post office (e.g. Killean and Aikensville) did not grow, and yielded to the larger centres as transportation improved.

The homes of this period are characteristic; most were built in what is known as the Gothic Revival Style.⁹⁰ They were built in wood, in brick, and in stone, but the designs were almost identical (see Plate 13). The centre front door was flanked by a window in each of the downstairs front rooms. A porch was a common feature. The roof lines were steeper than those of the Middle I Period. A triangular dormer over the front door was characteristic; it served at least one useful function by keeping the snow from the roof from cascading onto the front step. Windows were twelve-paned until 1870, and four-paned after that date (the size of pane was determined by the size of glass that the glass-maker could fashion; as the techniques advanced, the window panes became larger).

The buildings of this period are distinguished also by arched windows, finials, lacy verandas and bargeboards, often referred to as "gingerbread".

Homes of this stereotyped design are so common throughout Southern Ontario as to be annoying. Where they are constructed of fine stonework, however, they can be very attractive.

Mention might be made here of stonework. The Scottish masons preferred granite fieldstone, split, and set with considerable mortar. Examples of this work can be seen along the First Concession road. German masons, however, preferred large, square-hewn, limestone blocks, set with little mortar. Examples of this work can be seen in the German-influenced village of Morriston.

In summary then, the Middle II Period saw continued prosperity of agriculture in Puslinch. It was a period of two cultures: cash crops — barley, peas, and wheat — continued to be important; with them and beside them improved cattle had become significant.

Throughout the period the forests were pushed back; crops of oats and hay took their place.

The rural population steadily declined, but hamlets that could fulfill specific functions grew.

The coming of the railway to Puslinch at the end of the Middle II Period coincided with the extension of the railway to the Canadian West. Puslinch could no longer compete in exports; she lost her character, and entered the macro-culture of Southern Ontario, with a mixed farming producing for the home market.



A Gothic Revival-style ~~stone~~ home, characteristic of the Middle II Period in Township of Puslinch.

8. Late Period

The Late Period, like the Early Period, saw Puslinch producing for home markets; but, unlike the Early Period, this market was Southern Ontario rather than merely Puslinch, and the product was livestock rather than wheat and potatoes.

Late I Period

Though the coming of the railway is symbolic of the absorption of Puslinch into the Southern Ontario culture, other factors spelled the end of the cash crop era in Puslinch.

The pea-weevil began its spread in the 1880's⁹¹; the acreage under this crop in Puslinch subsequently declined, until in 1921 little more than 800 acres were planted.

The Canadian Pacific Railway penetrated the prairies in 1882; Puslinch wheat could not compete with that from the West.

And the third cash crop of Puslinch -- barley -- had its American market cut from it by the McKinley Tariff of October 1890.

Puslinch, then, in the Late I Period, was left with only one agricultural economy -- livestock. Fortunately it had begun improvement of its cattle in the previous period; their numbers -- both milk and other cattle -- increased considerably throughout the Late I Period.

Increasing emphasis upon the feeds -- oats and hay -- had also begun in the Middle II Period. This emphasis continued to increase,⁹² until by 1921, 9,663 acres of oats and 10,204 acres of cultivated hay

were harvested -- three times the production of 1861, and almost twice the production of 1881.

Hog production, having earlier suffered considerably by the abrogation of the Reciprocity Treaty,⁹³ trebled between 1881 and 1891 to almost 4500 in the latter year. By 1931 their numbers had drifted down to slightly under 4000.

The fast and steady decline in sheep numbers that had begun in 1861 was checked in the Late I Period, dropping only 419 head in forty years.

Horse population in the township remained high and steady. Apparently the gasoline tractor had not yet made inroads, leaving much work for the horses.

These figures illustrate the change to a general, or mixed, farming. Increased emphasis upon livestock substituted for cash crops.

The Late I Period also saw a decrease in the number of farm operators, from 548 in 1891 to 475 in 1931. This was not accompanied, however, by any noticeable decrease in land occupied. We may calculate, therefore, a slight increase in average farm size from 105 acres in 1891 to 121 acres in 1931.

The general picture of the land shows a relatively steady amount of woodlot, but a decrease in intensity of use of the cleared land. Land in crops was reduced from 35,425 acres in 1891 to 27,904 acres in 1931. Far more land was put into pasture; this figure rose from 10,500 acres in 1891 to 16,782 acres in 1931.

The rural hamlets of Puslinch began to lose importance just

before World War I. At that time, the introduction of the telephone and of the rural mail service combined to destroy their function as a gathering-place. When it was no longer necessary to go to the local Post Office/General Store for the mail, the shopping was done in a larger centre with more to offer. The fate of such hamlets as Killean and Aikensville was sealed.

The coming of the motor-car and the paved highway further tended to draw the rural resident to the larger centres. But three of the four "largest" villages of Puslinch were located on a main road (the Aboukir Road, by then called the Brock Road, and by 1925, paved and called Provincial Highway No. 6); these villages lost little importance, and in fact, gained some benefit from the increased traffic.

Aberfoyle, in 1906, had a church, an hotel, a store, and the grist mill of the Middle Period. Morriston, in the same year, had "a number of stores, an hotel, flour and planing mills, a carriage factory, etc."⁹⁴ In 1915, with a population of 247, it was established as a Police Village.⁹⁵

Improved transportation — in this case railways — was connected with a number of other developments in the township. As noted earlier, at the end of the Middle II Period, the hamlet of Puslinch was favoured with considerable team traffic shuttling between there and Hamilton. It continued as a "busy centre" for about thirty years, being "the shipping point for the livestock industry in several townships and the grain trade operated by Henry W. Ironside"⁹⁶. But in 1911, the Canadian Pacific Railway completed a branch from Guelph Junction to Hamilton, ending the

necessity for a team shuttle. The large warehouse which had served this traffic was destroyed by fire in 1919.⁹⁷

With the coming of the railway also, came the emphasis upon the quarry industry. The Christie Quarry on Lot 29 of the Gore started operations about 1890, producing white lime from Guelph dolomite with a large draw kiln⁹⁸ (see Plate 14). The quarry at Glenchristie on the River Speed was opened in 1904, and also produced white lime.

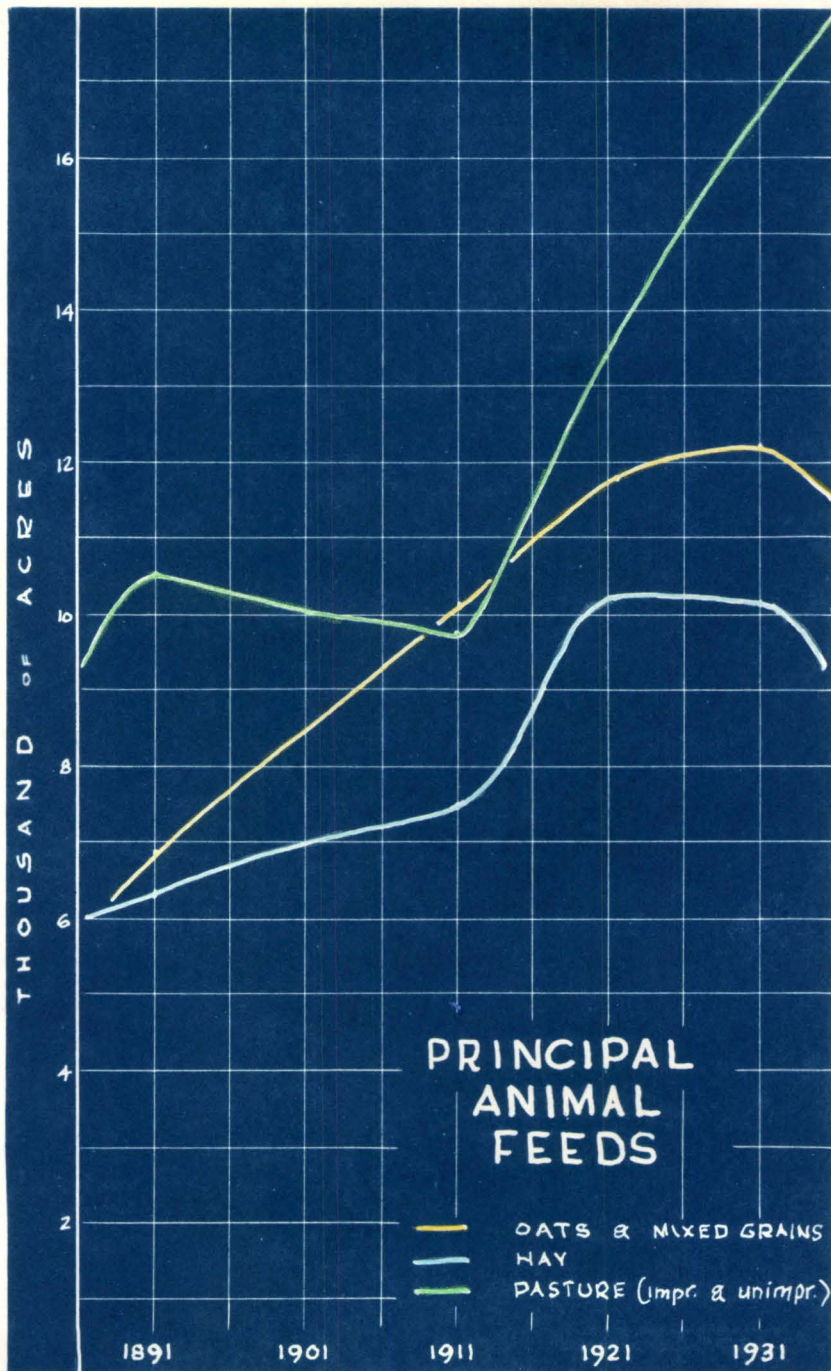
Maloney's Quarry on Lot 34 of the Gore was also opened in the early 1890's and by 1912 these workings were 600 feet by 200 feet and 15 feet in depth. Though it was said that this stone "should make an excellent stone for rock face work",⁹⁹ its output was nearly all converted into crushed stone. In 1928, this operation (called the Puslinch Quarry Co. Ltd.) was taken over by Canada Crushed Stone, and for a few years provided crushed dolomite for fettling the bottoms of basic open-hearth steel furnaces.¹⁰⁰

The Late I Period was a period of electric railways — real or proposed — throughout populous Southern Ontario. Puslinch was not without its proposal. In 1903 the City of Guelph purchased a 45 acre park site at Puslinch Lake, and the voters approved an electric railway from Guelph to the lake.¹⁰¹ By 1906 it was felt that "as soon as electric railways are in operation it will undoubtedly become a popular resort from Hamilton and Guelph".¹⁰² But this electric railway was never put into operation. Between 1923 and 1929, the City of Guelph spent over \$12,000 in improvements at the park; in that same period they received only \$1,300 in profits. It was regarded as an expensive plaything, and was sold to private enterprise in 1930.¹⁰³

No one architectural style can be said to be characteristic of the Late I Period. Rural homes were usually square and tall, of two or two and one-half stories. The material of their construction was most often brick, but plaster and lath scored and painted to represent stone was also common. Stone and wood were rarely used.

The era was not one of much building activity. In fact, a number of Middle II dwellings, when destroyed by fire, were not replaced. The farm that they once dominated was consolidated with that of a neighbour.

In summary then, in the Late I Period cash crops had virtually disappeared from Puslinch. In their place was a great emphasis upon oats, hay and pasture, supporting a livestock economy. Population continued to decline, and better transportation diverted patronage from the rural village to the larger towns outside the township. It was not a period of great prosperity for Puslinch, but its economy was better suited to the land than was the ^{economy of} cash crops of the earlier eras.





Above, the abandoned workings of the Puslinch Quarry Co. The area has a quiet, rugged beauty, and would make excellent parkland.

The site was quarried from 1890 to the 1930's, and was used for swimming until recent years.

Right, sacred monoliths of a vanished civilization? Vegetation engulfs the foundations of the crusher unit for the above quarry.



Left, the large draw kiln of the lime pits at Gore, L. 29.

9. Late II Period

The Late II Period continued the emphasis upon cattle that had been built up in the preceding periods. The Second World War contributed to an increase in milk cows and also to a considerable increase in swine. The latter was aided also by the introduction of grading in the 1920's, thus assuring the purchaser consistent quality.¹⁰⁴ Sheep production figures again show the rapid decline that had characterized the Middle II Period. Horses continued to be important on the farm until after the Second World War, but declined rapidly in numbers thereafter. In 1941, there were 1437 horses in the township; in 1951, there were only 784.

Though the figures for animal production show few startling tendencies during this period, the feed crops show a rapid and steady fall from their peaks of 1921-31 (see Fig. II- 7).

The decrease in small grain production can be explained by two factors:

- (a) more grain was being purchased at mills, instead of being grown on the Puslinch farms, and
- (b) grain production was being concentrated upon the better fields, thus increasing average yields, while decreasing acreage.

The average Puslinch yield for oats in the Late I Period was approximately 25 bushels per acre;¹⁰⁵ today average yield of this crop is reported as

35 bushels per acre on Burford loam, and 60 bushels per acre on Guelph loam in Wellington County.¹⁰⁶

Similar explanations can be given for the hay production figures. Perhaps more important in this case, however, was the introduction of alfalfa in the late part of the Late I or the early part of the Late II Period. Although no figures can be located for Puslinch, comparisons of alfalfa hay yields with timothy and clover hay yields in various parts of the eastern United States show those of alfalfa hay to be 50 per cent higher.¹⁰⁷

There is another factor too, that, when considered, makes these decreasing acreages less spectacular: this is the decreasing acreage of operating farmland in the township. When crop production figures are "adjusted" to relate to farm land in production, then it is seen that the production of hay crops increased relatively in importance after an initial drop between 1931 and 1941. Thus, especially when one considers the increased yields given by alfalfa, one can credit hay with increasing importance in the Late II Period.

Even with adjusted acreage and increased yields per acre, however, it is likely that oats and mixed grain production combined did fall considerably. Western feed grains supplied from mills was increasing in importance.

The end of the Second World War saw the beginning of the trend which is characteristic of the Modern Period. Acreages in use as farm land decreased drastically, by almost 5600 acres in the decade before 1951. The number of farm operators decreased also, so that there was

little change in average farm size (see Fig. II-8). This suggests that abandonment was of full average-size farms -- probably marginal land that had continued in use to meet war demands, but that had gone out of production as soon as this demand passed. Curiously though, except for a dip in numbers during the war, total farm population remained relatively steady.¹⁰⁸

Better transportation facilities worked further to reduce the functions of the rural villages. Only those functions that catered to the automobile (such as the service station and the repair garage) increased their importance. It was only along Highway No. 6 that these were favoured.

With improved transportation and city pressures came the family institution of the summer cottage. These seasonal habitations popped up like mushrooms along the shores of Puslinch Lake. Increased urban pressures were also manifested in an increase in non-farm residents in Puslinch. By 1951, these people accounted for 40% of the township's total population.

Industrially-speaking, the Late II Period was one of consolidation. Large corporations bought out many small firms, and concentrated upon increased efficiency and increased output at a few of these formerly small workings.

In the case of Maloney's Quarry, Puslinch lost, for after operating it for a few years, Canada Crushed Stone abandoned these workings and increased their output at Dundas. Similarly, when Canadian Gypsum, Lime, and Alabastine purchased small lime concerns all over Southern

Ontario, the quarry and kiln on Lot 29 of the Gore was shut down. But at the same time, this company increased its operations at Glenchristie, giving Puslinch its largest industry. The two abandoned quarries gave swimming holes to the Puslinch young folk, and later came to be much used by the swimmers of Hamilton.

In the Late II Period, in summary, the abandonment of farms became painfully evident. Industries were being consolidated, and Puslinch was generally the loser. The automobile was giving a new function to the highway communities, but was sending the rural population to shops in the large cities. Any advantages gained during the Late II Period were overshadowed by the decrease in occupied farm land.

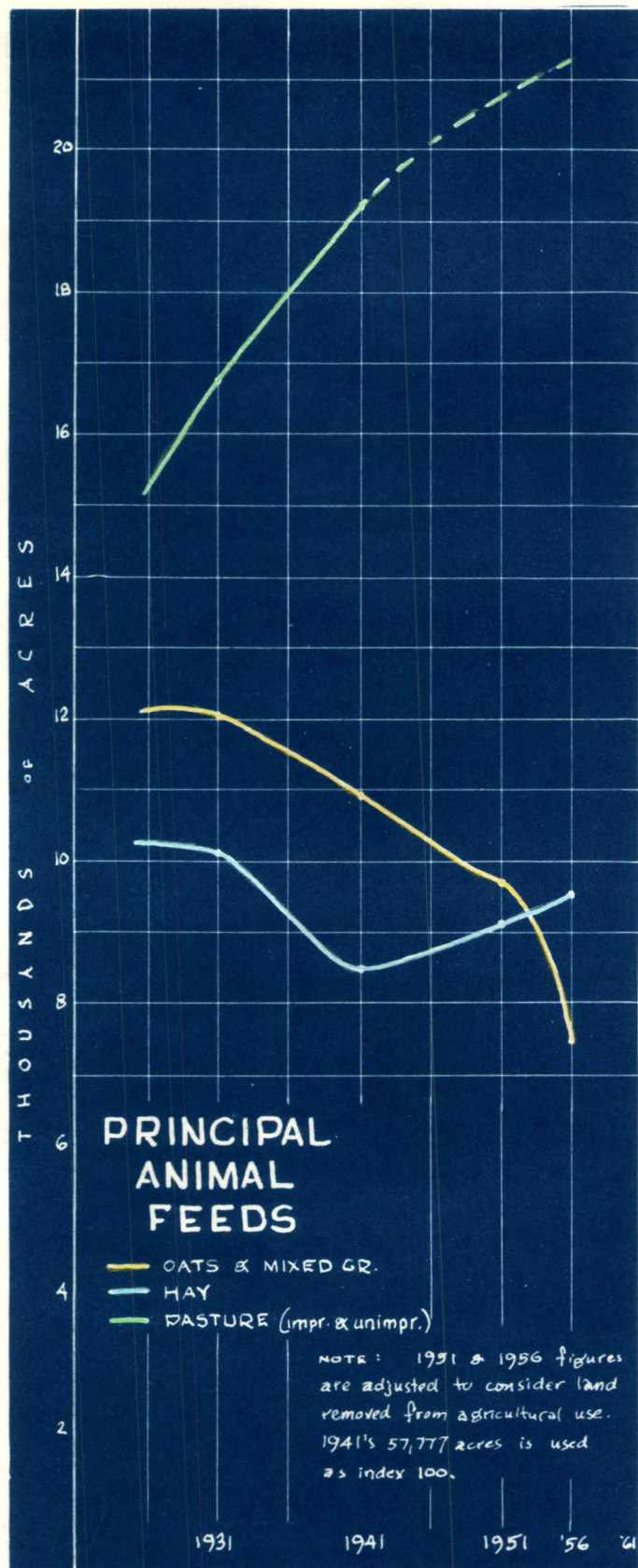
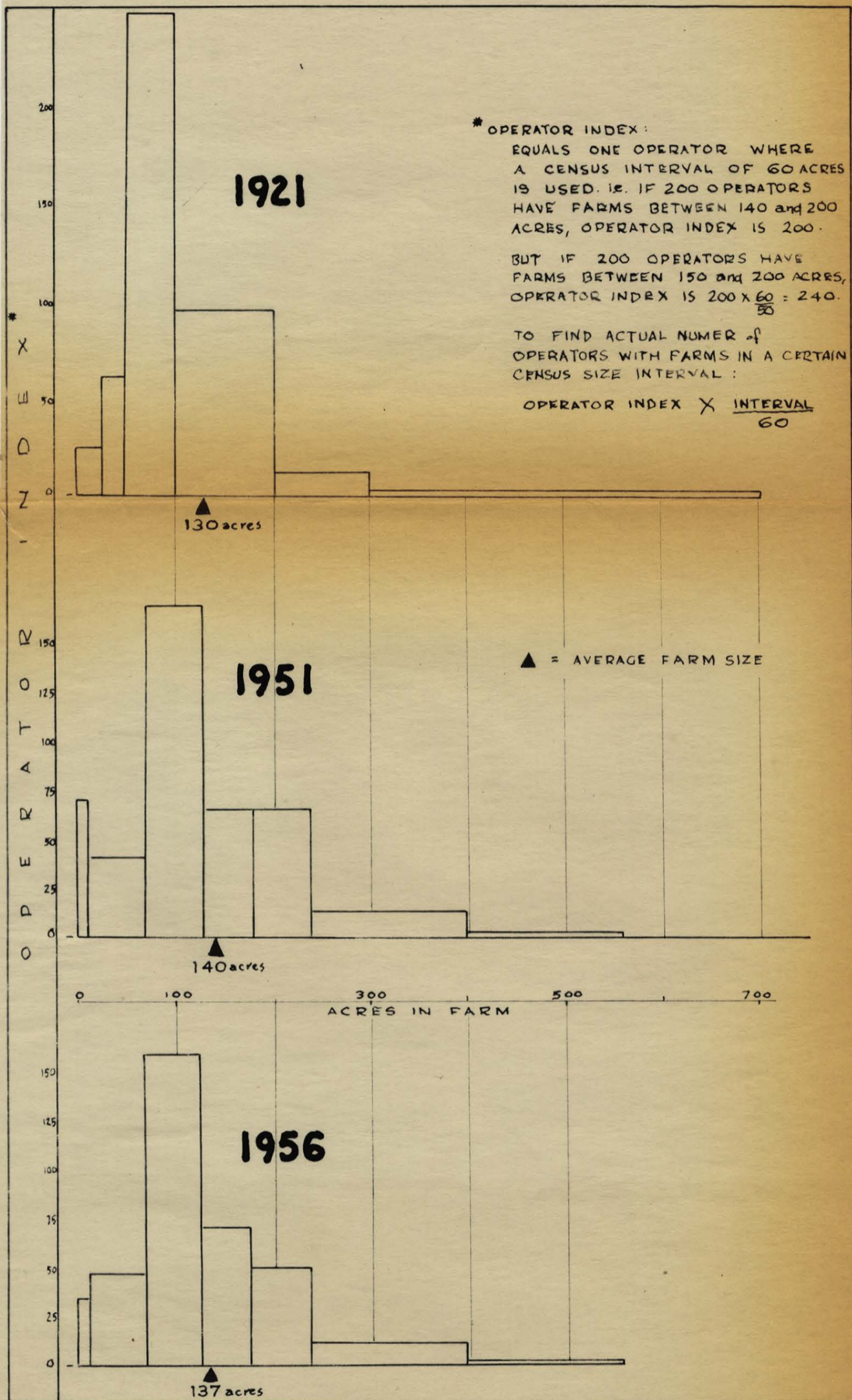


FIG. II-7





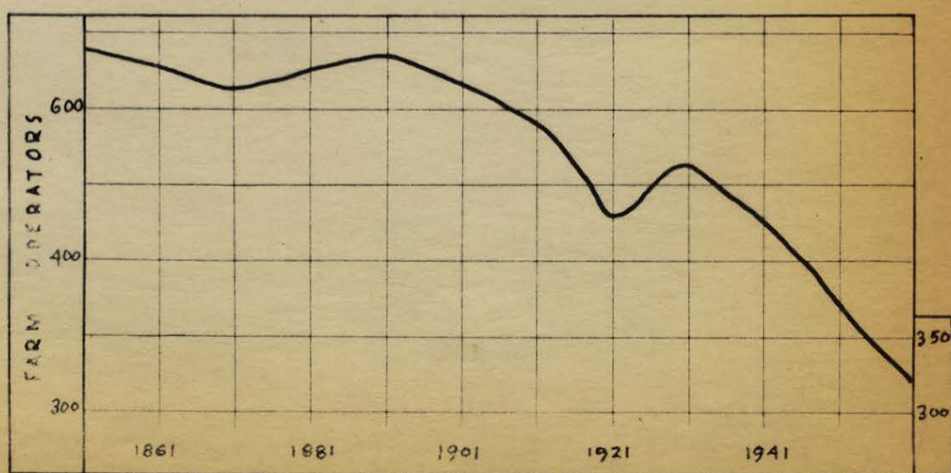
 **FARM SIZE**
 AND
 NUMBER OF FARM OPERATORS 

FIG. II-8



10. The Modern Period

The Modern Period has seen farm abandonment continue at an increasing rate. As yet, however, no increase in average farm size has occurred (see Fig. II-8), though it is noted in the field that those farmers who are prospering occupy more than the average of 140 acres.

More feeds are being purchased at the mill, so that the acreage of grain crops in Puslinch continues to fall (see Fig. II-7). The increased land thus available is put partly into hay, and very much into pastures, both improved and unimproved. Acreage of improved pasture rose from 9,425 in 1951 to 12,829 in 1956. When this is weighed against the reduced area of producing land, the increase becomes even greater. Thus, of all field crops, the only one to show even a relative increase is hay; the emphasis upon leguminous fodder is reinforced by the rising acreages in improved pasture.

The decreasing acreage of grains, the increasing acreage in hay and pasture, and the loss of approximately fifty farms, (totaling almost 8,000 acres) since 1951 have had significant effects upon the landscape.

The horse population has continued to fall; in 1956 only 418 horses could be counted in the township.

Swine figures too, have fallen, following Britain's resumption of normal trade patterns after World War II. In the Modern Period the home market, and to some extent the American market, is the main desina-

tion of the Puslinch pig.

Sheep population has seen its first increase in one hundred years, increasing however, only 121 head in the five years previous to 1956. The Ontario Department of Agriculture states that "sheep flocks can be expanded without fear of over-production".¹⁰⁹

The number of milk cattle decreased considerably, a result of the introduction of the contract and bulk cooler system, which has forced the small operator out of business.

Two specializations are increasing in importance. Recent years have seen the introduction of the broiler type poultry farm, utilizing purchased feed. The second specialization, and probably far more important, is that of beef cattle.

Numbers of non-milk cattle jumped by more than 1300 head in the five years prior to 1956. Since that time, two farmers in Puslinch have gone into the operation of feeder cattle farms. These two farmers alone have raised the beef cattle population of Puslinch by more than 600 head. Thus, this is one of the most noteworthy changes in the agriculture of Puslinch since the end of the cash-grain era.

The farm population is remaining relatively steady, but the non-farm population is continuing the rapid increase that it began after the Second World War. String suburban development has spread out from Guelph, mostly along paved roads. Subdivisions have recently been built upon on the northern township border, adjacent to Highway No. 6. Modern motels and restaurants are also springing up. Along Highway No. 6, for two or three miles in Puslinch south of Guelph, land subdivided for housing lies

idle. Then too, as the fine stone homes of the Middle Periods lose their farming inhabitants, they in many cases gain a former city dweller who may hobby farm or who may continue to concentrate only upon his work in the city, leaving the land idle.

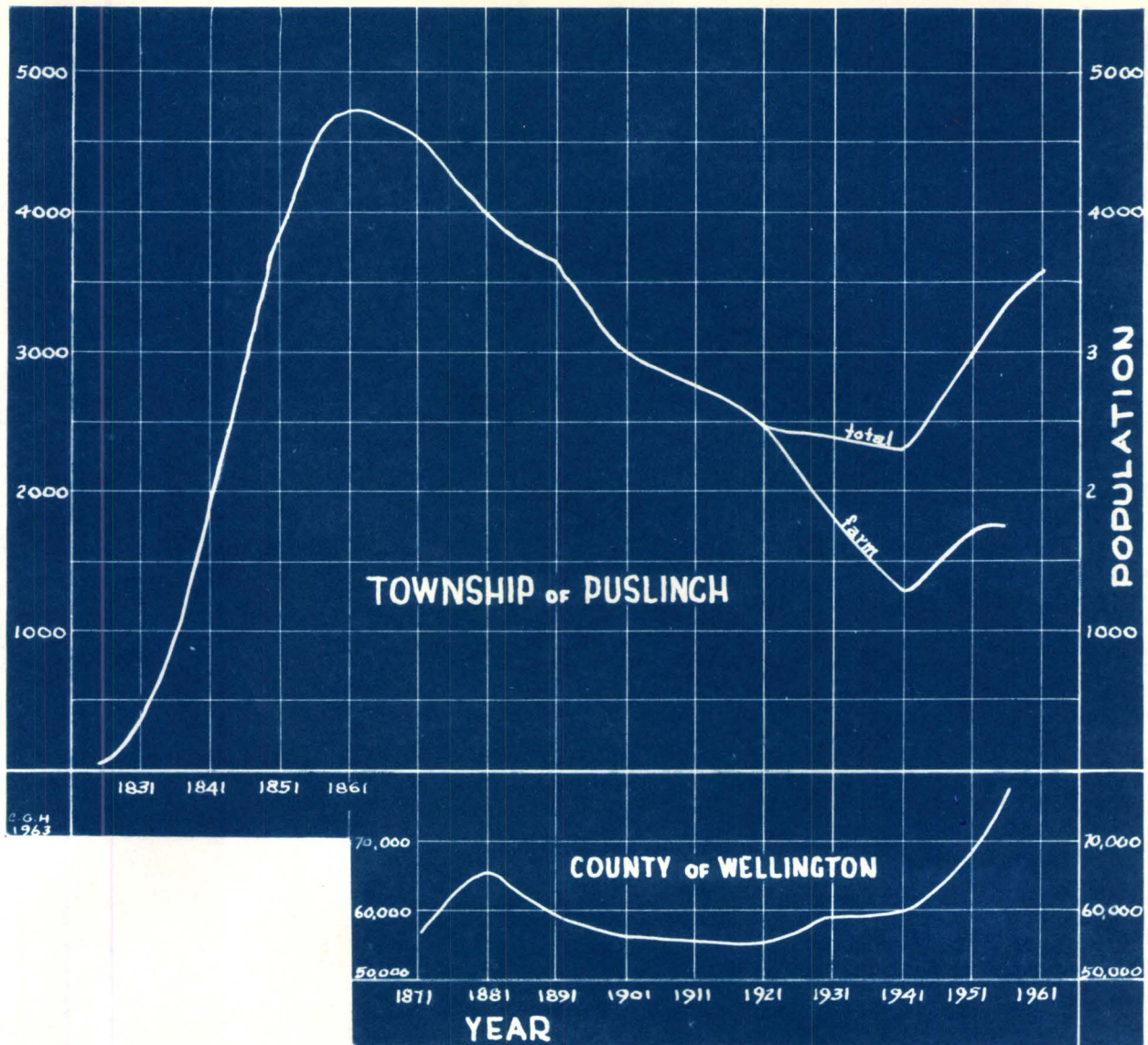
Roads are being steadily improved to meet the demands of the modern motorcar. Main township roads are seeing their dangerous jogs realigned, and disturbing hills cut and filled. For some years there has been talk of reconstructing Highway No. 6, which is now carrying the greatest volume of traffic it has ever seen.

And, as the twin ribbons of steel brought Puslinch firmly into the sphere of Southern Ontario in the railway age, so the twin lines of asphalt and concrete of Highway No. 401 have tied it firmly to Southern Ontario in the motorcar age. This modern motorway pierced Puslinch from east to west in the fall of 1961, and already has had significant influences in the township. Its influence in the future will likely be great.

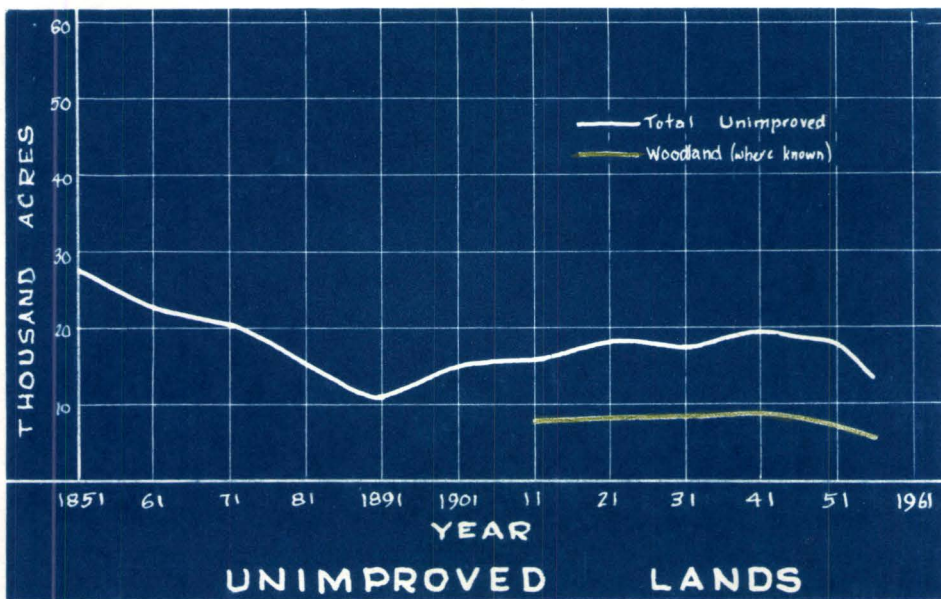
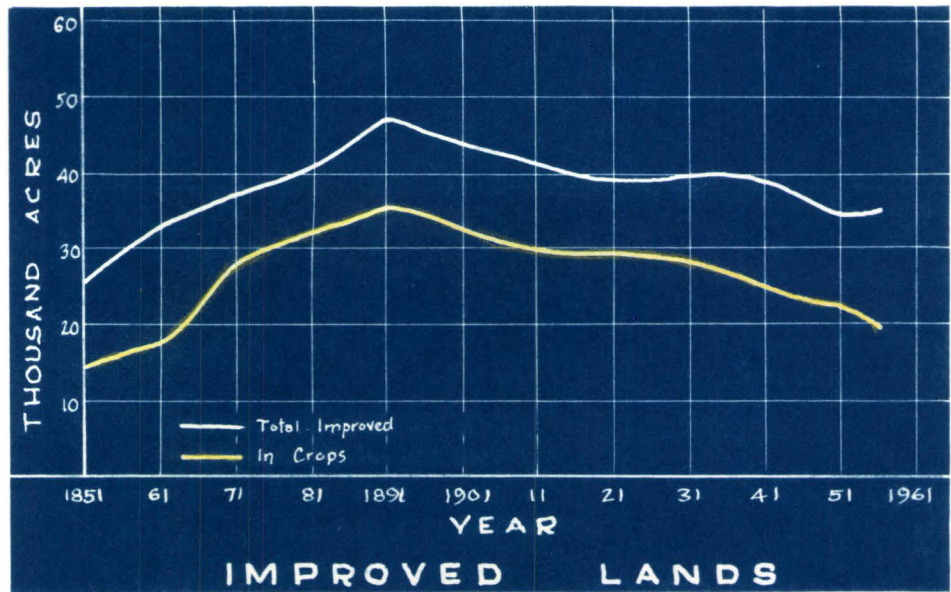
In the Modern Period, Puslinch has gained at least one "major" industry. This is the Aberfoyle Sand and Gravel, a legacy of Highway 401 construction, having been opened as a borrow-pit for that road. It is operating on the outwash gravels of the Aberfoyle Plain, and, in the fall of 1962, commenced permanent operations with a large concrete and steel crusher and washer structure.

Recreational endeavours such as Barber's Beach and Butler's Beach (Puslinch Lake), Emerald Lake (Christie Quarry, Gore, Lot 29), and Aberfoyle Mill Pond are seeing increasing use and modernization programs.

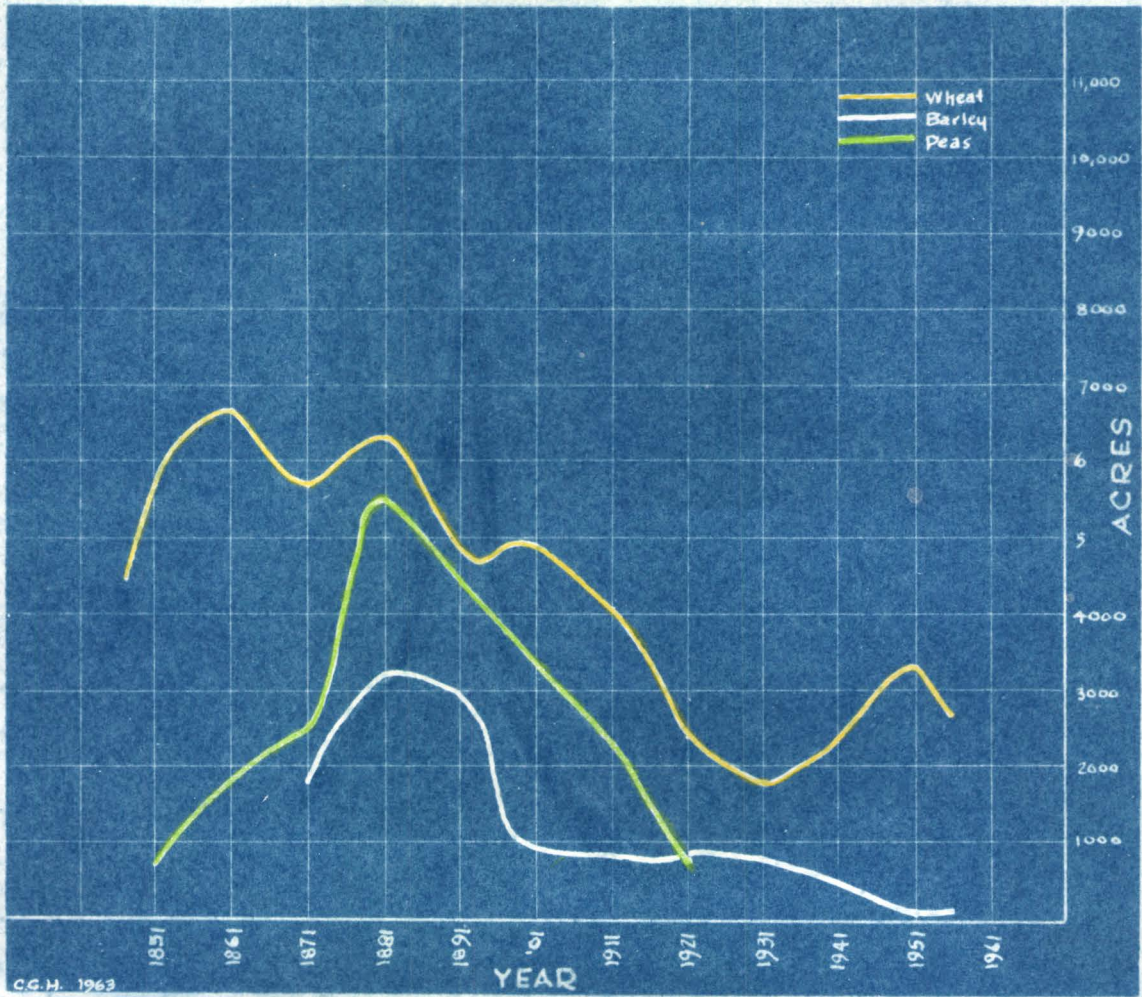
In summary, there is continuing abandonment of general farms, but an increase in beef specializations. Urban populations are converting the township to their own use. This is manifested as a drive for subdivisions, hobby farms, gravel pits and recreational facilities.



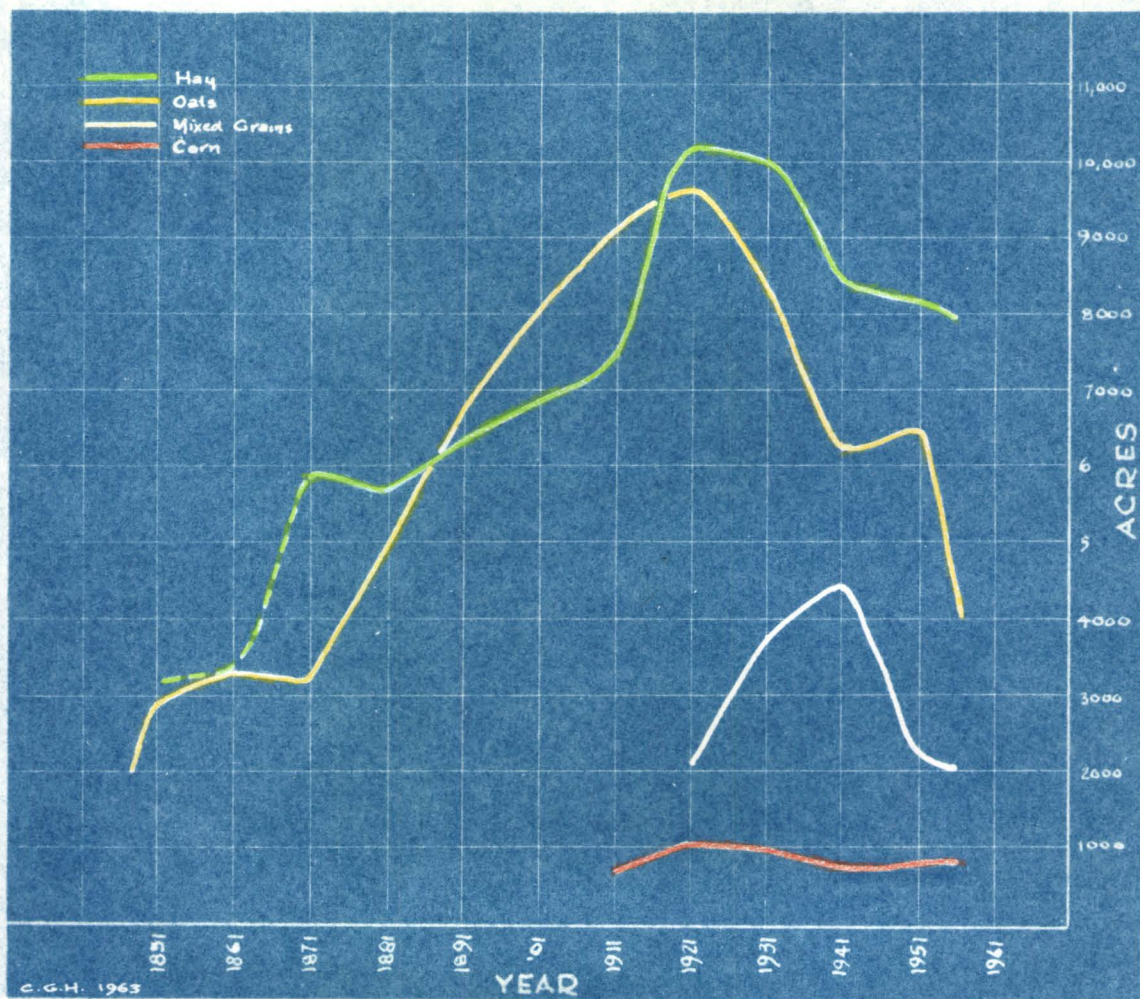
POPULATION FIG.II-9



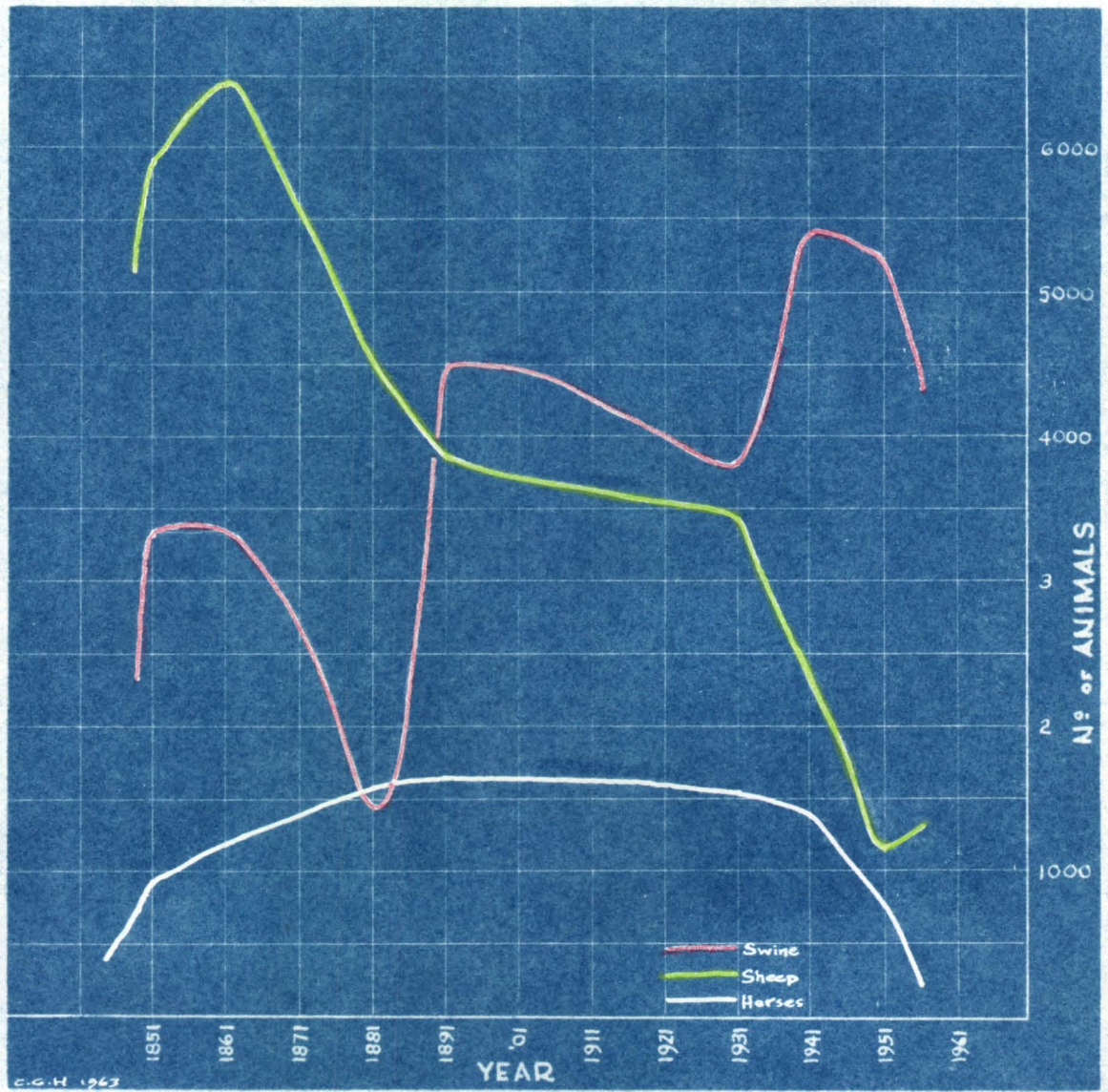
CONDITION OF LAND FIG. II-10



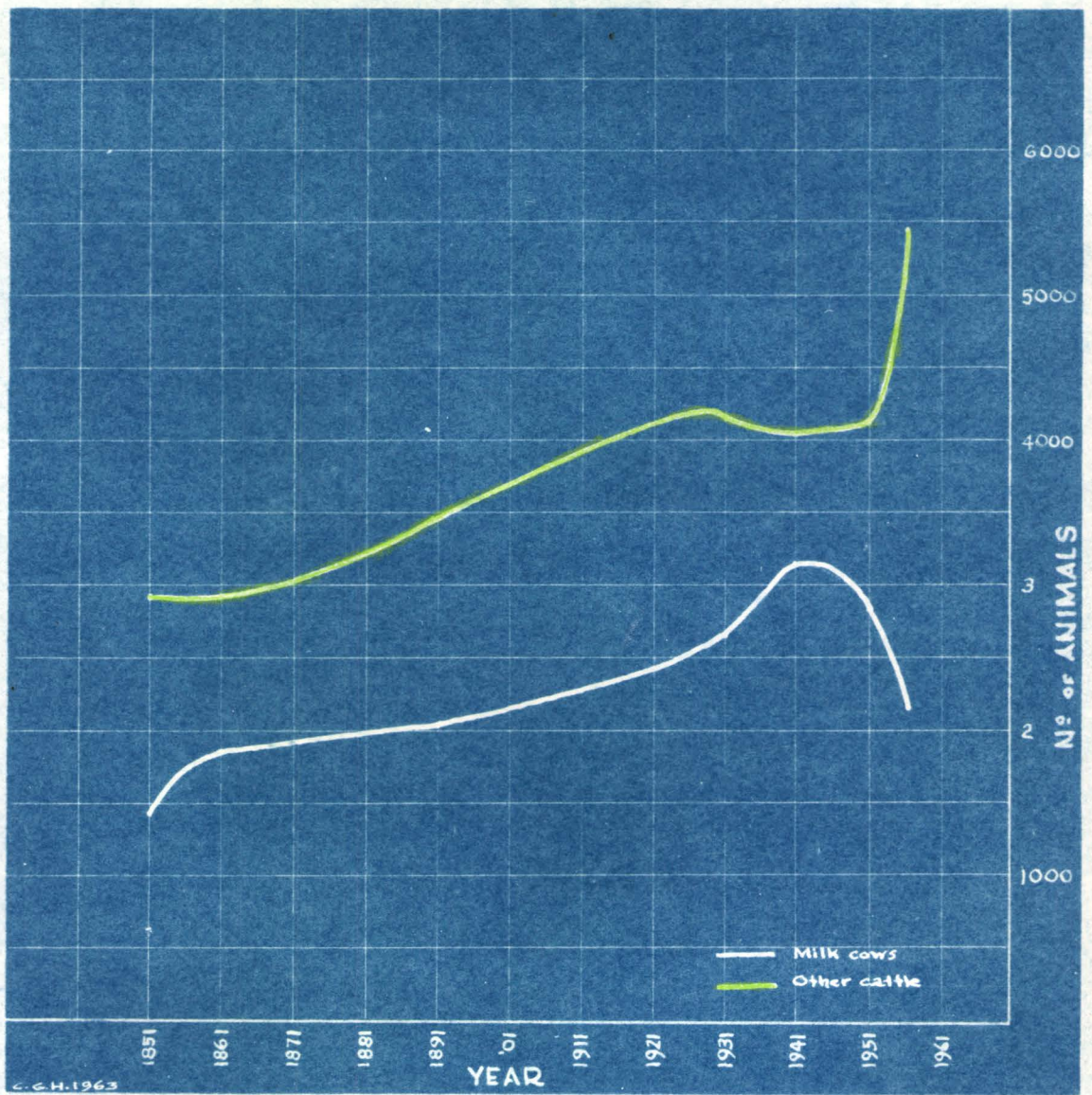
"CASH" CROPS FIG. II-11



"FEED" CROPS FIG. II-12



SWINE, SHEEP, HORSES FIG. II-13



CATTLE FIG. II-14

FOOTNOTES to BOOK TWO

- 1 Winfield Brewster, J. Hespeler, New Hope, C.W.,
The T. & T. Press, Hespeler, Ont., 1951, p. 5.
- 2 Ibid, p. 7-8; see also Brewster, La Rue de Commerce,
The T. & T. Press, Hespeler, Ont., 1954, p. 10.
- 3 The author managed to track them down to the Central
Public School in Hespeler; they had been sent
shortly before to Kitchener for a display.
- 4 G. Patterson, Land Settlement in Upper Canada,
Report of the Ontario Dept. of Archives, 16,
1920, p. 221.
- 5 Ibid; see also Plate 11.
- 6 Cited in Patterson, op. cit., p. 206.
- 7 Patterson, loc. cit.; This "mistake" was likely made so
that the reserve lots could be easily distributed
in a concession block, which had six lots of two
hundred acres at that time.
- 8 Ibid, p. 46.
- 9 Ibid, p. 200.
- 10 Ibid, p. 201.
- 11 Assessment Return, cited in Spender^c Creek Conservation
Report, History Section, Department of Lands and
Forests, Conservation Branch, Toronto, 1962, p. 173.
- 12 Anne Haldane, The Historical Geography of Waterloo Township,
M. A. thesis, McMaster University, Hamilton, 1963.
- 13 Patterson, op. cit., p. 212.
- 14 Historical Atlas of County of Wellington, Ontario,
Historical Atlas Publishing Co., Toronto, 1906,
p. 7, col. 3. (Hereafter referred to as Historical
Atlas.)

- 15 See field notes on file for Puslinch Township in Dept. of Lands and Forests, Maps and Surveys, East Block, Queen's Park, Toronto.
- 16 Annals of Puslinch, 1850-1950, The Acton Free Press, Acton, Ontario, 1950, p. 46.
- 17 See old map on file at Dept. of Lands and Forests, as in footnote 15 above; this shows settlers' names, and any clearings and trails noted during original survey.
- 18 Historical Atlas, p. 7, Col. 3.
- 19 See Annals of Puslinch; and works by Winfield Brewster listed in bibliography of this dissertation.
- 20 Ibid, p. 26; see also Brewster, The Floodgate, The T. & T. Press, Hespeler, Ont., 1952, p. 19-25.
- 21 Annals of Puslinch, school sections nos. 4, 5, 6, 7, 8, and 9.
- 22 Historical Atlas, p. 7, col 2-3.
- 23 Ibid, p. 7, col. 2.
- 24 Annals of Puslinch, p. 57-64.
- 25 Ibid, p. 15.
- 26 See map of this survey in Dept. of Lands and Forests, as in footnote 15, above.
- 27 W. H. Smith, Canada: Past, Present and Future, Thomas Maclear, Toronto, 1851, p. 93.
- 28 Loc. cit.
- 29 Loc. cit.
- 30 Canada Census; unless otherwise noted, all statistics relating to 1851 and later dates are drawn from the Canada Census.
- 31 Smith, op. cit., p. 106-7, p. 126.
- 32 This was the word used by John Galt in 1827 as he symbolically felled the first tree to mark the site of Guelph. The forest was dripping with rain; he and his group warmed themselves by drinking toasts to the whole royal family.

- 33 Winfield Brewster, La Rue de Commerce, The T. & T. Press, Hespeler, 1954, p. 24.
- 34 Historical Atlas, p. 2, col. 2.
- 35 Annals of Puslinch, p. 15.
- 36 Brewster, La Rue de Commerce, p. 24.
- 37 Annals of Puslinch, p. 67; see also early map, at Dept. of Lands and Forests, Toronto.
- 38 Brewster, La Rue de Commerce, p. 24; see also Annals of Puslinch, p. 81.
- 39 This statement is based upon implications, and is not to be considered strong. See Brewster, The Floodgate, p. 28-9 and references of footnotes 40 and 41.
- 40 Annals of Puslinch, p. 35.
- 41 Brester, The Floodgate, The T. & T. Press, Hespeler, Ontario, 1952, p. 39.
- 42 Brewster, La Rue de Commerce, p. 24.
- 43 Historical Atlas, p. 3, col. 1.
- 44 Canada Census; all statistics from this date on are taken from this source.
- 45 R. L. Jones, History of Agriculture in Ontario, 1613-1880, University of Toronto Press, Toronto, 1946, p. 210.
- 46 Ibid., p. 184, p. 209.
- 47 Ibid., p. 194
- 48 Ibid., p. 138
- 49 Ibid., p. 137
- 50 Ibid., p. 177-8
- 51 Ibid., p. 181
- 52 Ibid., p. 197-8
- 53 Ibid., p. 192

- 54 Journal and Transactions of the Board of Agriculture of Upper Canada, Vol. I, Toronto, 1856, see "Report for the Agricultural Society for Puslinch, 1856".
- 55 Ibid., "Report on the State of Agriculture in the County of Wellington, 1852.", p. 219, p. 220.
- 56 Ibid., p. 219.
- 57 Ibid., p. 223.
- 58 Jones, op. cit., p. 96ff.
- 59 Ibid., p. 204.
- 60 As in footnote 57.
- 61 Smith, op. cit.
- 62 Annals of Puslinch, p. 119.
- 63 See, for example, the history of Morriston as presented in Annals of Puslinch, p. 62-4.
- 64 This should be corrected to read "with a hotel that later became a general store.", Annals of Puslinch p. 27.
- 65 Historical Atlas, p. 7. col. 1, p. 8, col. 1; Annals of Puslinch, p. 33-37; Province of Ontario Gazeteer and Directory, Robertson and Cook, Toronto, 1869, "Aberfoyle".
- 66 Similar to footnote 65; in Annals , see p. 62-4, in Gazeteer, see "Morriston".
- 67 Journal and Transaction of the Board of Agriculture of Upper Canada, p. 218.
- 68 See Plate 12 .
- 69 Refer to graphs at end of this Book, following page 107 .
- 70 Jones, op. cit., p. 244.
- 71 Ibid., p. 219, 240-42.
- 72 Ibid., p. 245.
- 73 The McKinley Tariff was imposed in October, 1890, yet at Census time, April, 1891, Puslinch recorded its largest acreage of barley yet. It appears to have dropped quickly thereafter, however.

- 74 Jones, op. cit., p. 223-30.
- 75 Ibid., p. 274-5
- 76 Interview, February, 1963, with Mr. R. Starkey, Arkell.
- 77 Jones, op. cit., p. 266.
- 78 Ontario Agricultural Commission Report,
(5 vols.), Toronto, 1881.
- 79 Ibid.
- 80 Ibid., Vol. 1, p. 231.
- 81 Ibid., Vol. 1, p. 242.
- 82 Annals of Puslinch, p. 33-37; Gazeteer, 1869, "Aberfoyle".
- 83 Annals of Puslinch, p. 62-64.
- 84 Ibid., p. 118.
- 85 Ibid., p. 119.
- 86 There is no evidence that the whiskey men burnt down the rival establishment; rather, it is said that the fire started in the hotel.
- 87 All information of Crieff from Annals of Puslinch, p. 49-50, and local residents.
- 88 Annals of Puslinch, p. 16-19.
- 89 "Puslinch Lake", Evening Reporter, Galt, Ontario, November 30, 1959, p. 10.
- 90 See publications of the Architectural Conservancy of Ontario, especially a small folder published in 1962, which gives a short graphic history of architecture in Ontario.
- 91 L. G. Reeds, The Agricultural Geography of Southern Ontario, Ph. D. thesis, University of Toronto, 1955, p. 149.
- 92 Refer to graph at end of this chapter "Principal Animal Feeds".
- 93 Jones, op. cit., p. 225.

- 94 Historical Atlas, p. 8, col. 1.
- 95 Annals of Puslinch, p. 118.
- 96 Loc. Cit.
- 97 Loc. cit.
- 98 M. F. Goudge, Limestones of Canada - Pt. IV, Ontario.
Canada Dept. of Mines and Resources, Mines and
Geology Branch, Ottawa, 1938, p. 295.
- 99 W. A. Parks, Report on the Building and Ornamental Stones
of Canada, Vol I, Canada Dept. of Mines,
Mines Branch, Ottawa, 1912, p. 267.
- 100 See Report by Goudge (footnote 98), and article on Canada
Crushed Stone in Rock Products, April 19, 1932,
p. 20-25.
- 101 "Puslinch Lake", Evening Reporter, Galt, Ontario,
November 30, 1959, p. 10.
- 102 Historical Atlas, p. 8, col. 1.
- 103 Evening Reporter, as in footnote 101.
- 104 Swine Husbandry in Ontario, Bulletin 500, Ontario
Department of Agriculture, Toronto, 1959, p. 1-4.
- 105 By Calculations from Census data.
- 106 Soils Report for Wellington County, Ontario Agricultural
College, Guelph, as yet unpublished.
- 107 K. H. W. Klages, Ecological Crop Geography, The Macmillan
Co., New York, 1942, p. 538, 534.
- 108 This might be due to a "baby boom" after World War II,
giving a sort of artificial population increase.
If this is the case, these people can be expected to
flow out of the township between 1961 and 1965
(age 16-20). The 1961 census (not yet available
in detail) will be interesting in this respect.
- 109 Sheep Husbandry in Ontario, Bulletin 499, Ontario Dept.
of Agric., Toronto, 1961, p. 3; the increase in
sheep numbers in Puslinch does not appear to have
been on marginal land.

MADE IN CANADA

BOOK THREE : MAN and LAND TODAY

1. Tax Assessment

The 1961 taxation assessment of Puslinch provides a guide to the modern township economy (see Fig. III-1). Farming is still the most important source of tax monies, providing fifty-two per cent of the total assessment. The farmer receives a good standard of roads and of schools in return.

The next largest assessment is on non-farm residences, and yields a rather surprisingly large portion of the total. This thirty-five per cent includes residences in the villages of Aberfoyle, Morryston and Arkell, as well as the suburban homes strung south from Guelph along Highway No. 6. Included also are summer cottages at Puslinch Lake, and the few non-farm residences elsewhere in the township. These taxpayers receive similar services to those of the farm-dweller.

Slightly more than ten per cent of the assessment is levied on commercial establishments. Most of these are along Highway No. 6. Also included in this levy are the resorts at Puslinch Lake, and transportation and communication systems such as railways, pipelines, and telephone and telegraph lines.

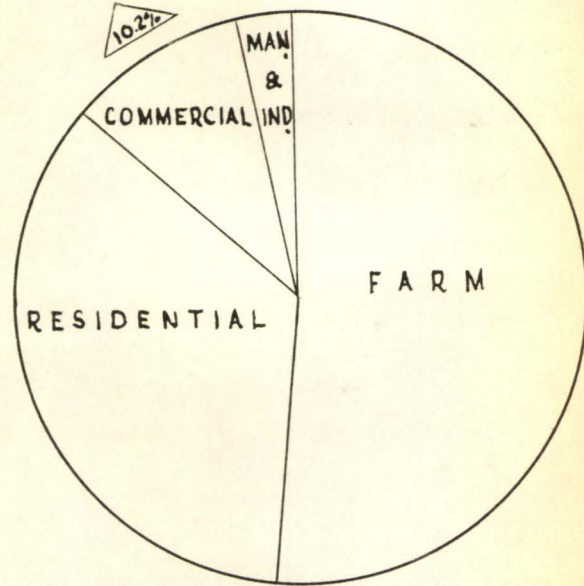
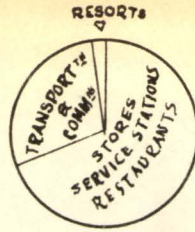
Only three per cent of the assessment is manufacturing or industrial. Much of this is provided by a large lime concern on the western township boundary, effectively cut off from the township by the River Speed. Two or three logging concerns and a few small gravel pits provide the remainder.

The Township of Puslinch is basically a farming township. Its urban development is extremely small. Yet its non-farm residential assessment is almost one-third of the total. The township is presently providing excellent road and school services both to the farmer and non-farmer. But the family that moves from the city to suburban developments in Puslinch may also want sewers, piped water, and street lights. Sewers and piped water must be provided in any case when the housing density increases. These services will be costly, and the farmer should not have to bear the burden. Planning, both financial and physical, must be done now, before the need arises -- and before it is too late.

| | | |
|----------------------------|-----------|--------------|
| TOTAL ASSESSMENT | ... | \$ 4,212,769 |
| RESIDENTIAL | 1,473,300 | |
| COMMERCIAL | 431,349 | |
| MANUFACTURING & INDUSTRIAL | 133,800 | |
| FARM | 2,174,320 | |

COMMERCIAL is further divided:

| | |
|--------------------------------|---------|
| GENERAL | 288,600 |
| RESORTS | 19,900 |
| TRANSPORTATION & COMMUNICATION | 122,849 |



TOWNSHIP
OF
PUSLINCH
ASSESSMENT
1961

FIG. III-1

2. Hinterlands of Neighbouring Urban Centres

Since such large urban centres exist on the borders of Puslinch — and are likely the explanation for the void of such centres within the township — it was felt that their hinterlands within Puslinch should be determined. Several indicators were chosen, and an attempt was made to apply these to Galt, Hespeler and Guelph.

The use of such indicators as food and clothing stores was abandoned early, for it was found that the time available, and the large size of Galt and Guelph, made their use impractical.

In Hespeler it was found that the bank managers knew their customers and their locations; a trade area could thus be indicated on a map without revealing names. But in the larger centres, the managers had little personal contact with customers, and could give little information about their trade areas.

Three indicators, however, could be definitely plotted upon maps. The first of these was rural mail routes. The routes of Galt and Hespeler display a pattern much influenced by paved roads (see Map III-2). This is to be expected, since rural mail is a service to be provided by the quickest and least expensive route; it matters little from where the mail comes.

The second important indicator was newspaper circulation. Interviews were obtained with the circulation managers of the Galt Evening Reporter and the Guelph Mercury. Enquiry was also made with the Hespeler

Herald, a weekly paper.

The Guelph Mercury supplied most of the township by daily motor throw-off. Considerable numbers were also left at village stores, from whence, it is felt, they made their way to the areas not covered by motor route. The Galt Evening Reporter was supplied daily to the south-west portion of the township by a similar system. The south-east township boundary was the effective cut-off for the Guelph Mercury; beyond that line, the Hamilton Spectator was supplied daily by motor. The weekly Hespeler Herald was delivered by mail; its circulation in Puslinch corresponds with the Hespeler rural mail route.

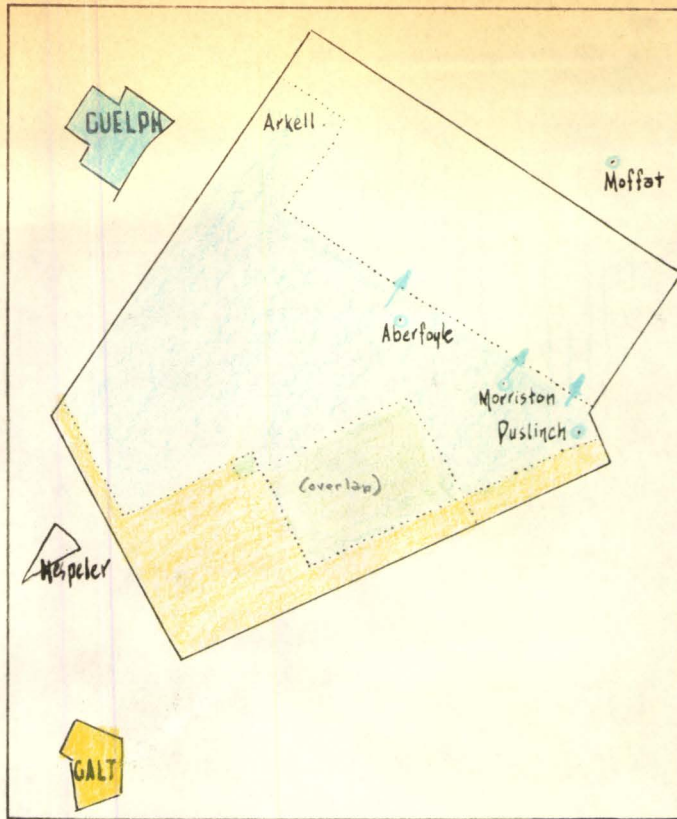
Daily papers are good indicators because they are chosen by the resident; and he chooses the paper from the city that will best supply his interests and his needs.

The third useful indicator was that of telephone exchanges. The workers in the Bell Telephone Office in Galt and Guelph were most friendly and helpful; mapped information was supplied. The Hespeler exchange covers most of the south-west portion of the township; most of the remainder is supplied by Guelph. Only a few farms on the southern border are supplied by Galt in the west and Freelton (on the Hamilton exchange) in the east.

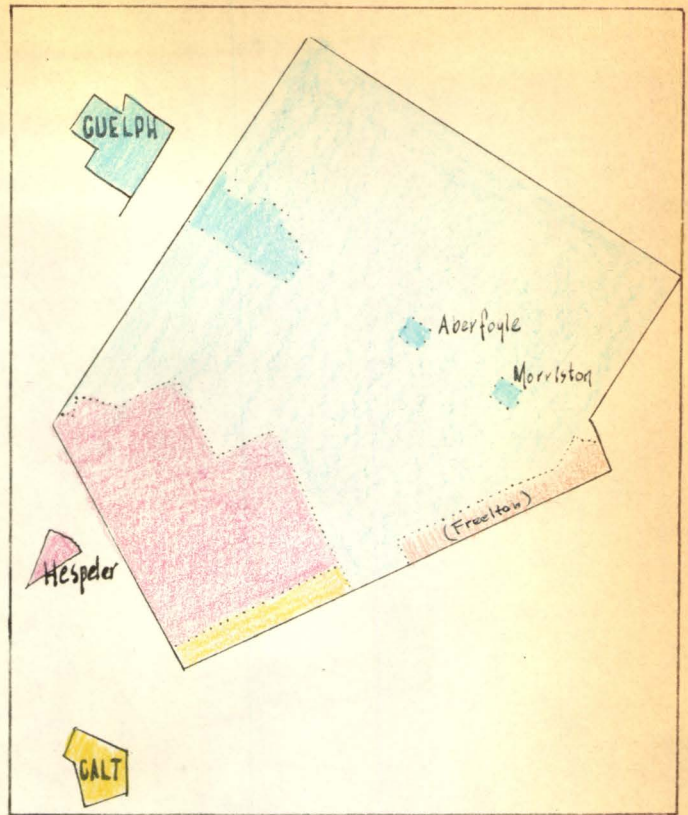
Some very important information was gleaned from the Guelph office. Residents of Puslinch to the south of Highway No. 401 and along Highway No. 6 were asked if they would prefer to be on the Freelton exchange, and thus be able to call Hamilton toll-free. Their answer was no; they wished to remain with Guelph. Further indicating strong ties

with Guelph, the Bell Telephone are soon to offer urban-type two party service to the villages of Aberfoyle and Morriston. A similar service is to be offered to Guelph's urban expansion southward along Highway No. 6, in the north of the township. These will be part of the Guelph urban exchange system. The telephone exchanges are partially governed by the physical system of distribution lines, but the Bell Telephone policy of enquiry and planning make them good indicators of urban hinterlands.

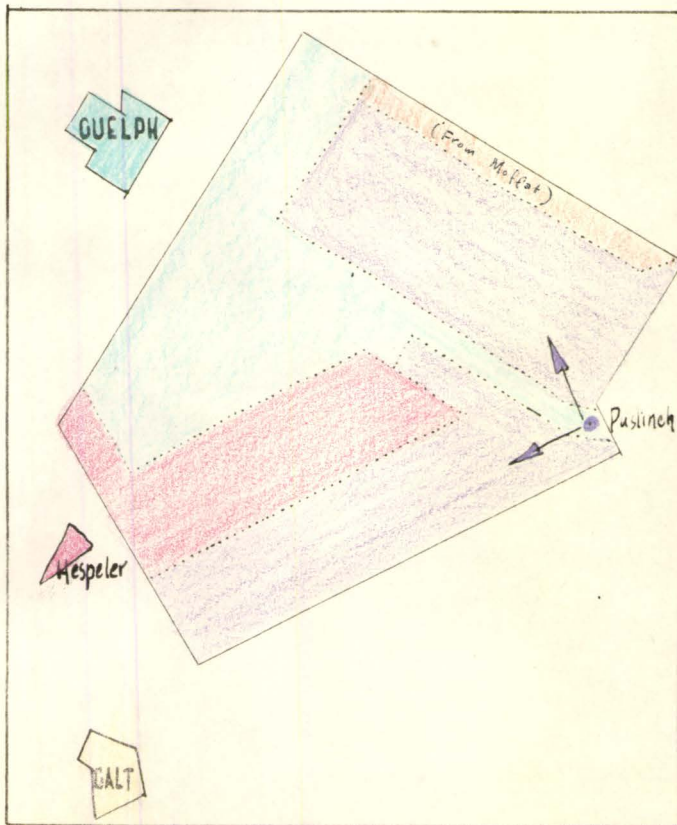
With all of these indicators then, ^{and} in the light of interviews with Puslinch residents, Map III-3, showing the hinterlands of Galt, Hespeler, and Guelph within the township is drawn. The whole of the township can be said to be within the hinterland of Guelph. The influences of Galt, Hespeler, and Hamilton are only peripheral -- even there they are not dominant.



NEWSPAPER CIRCULATION



TELEPHONE EXCHANGES



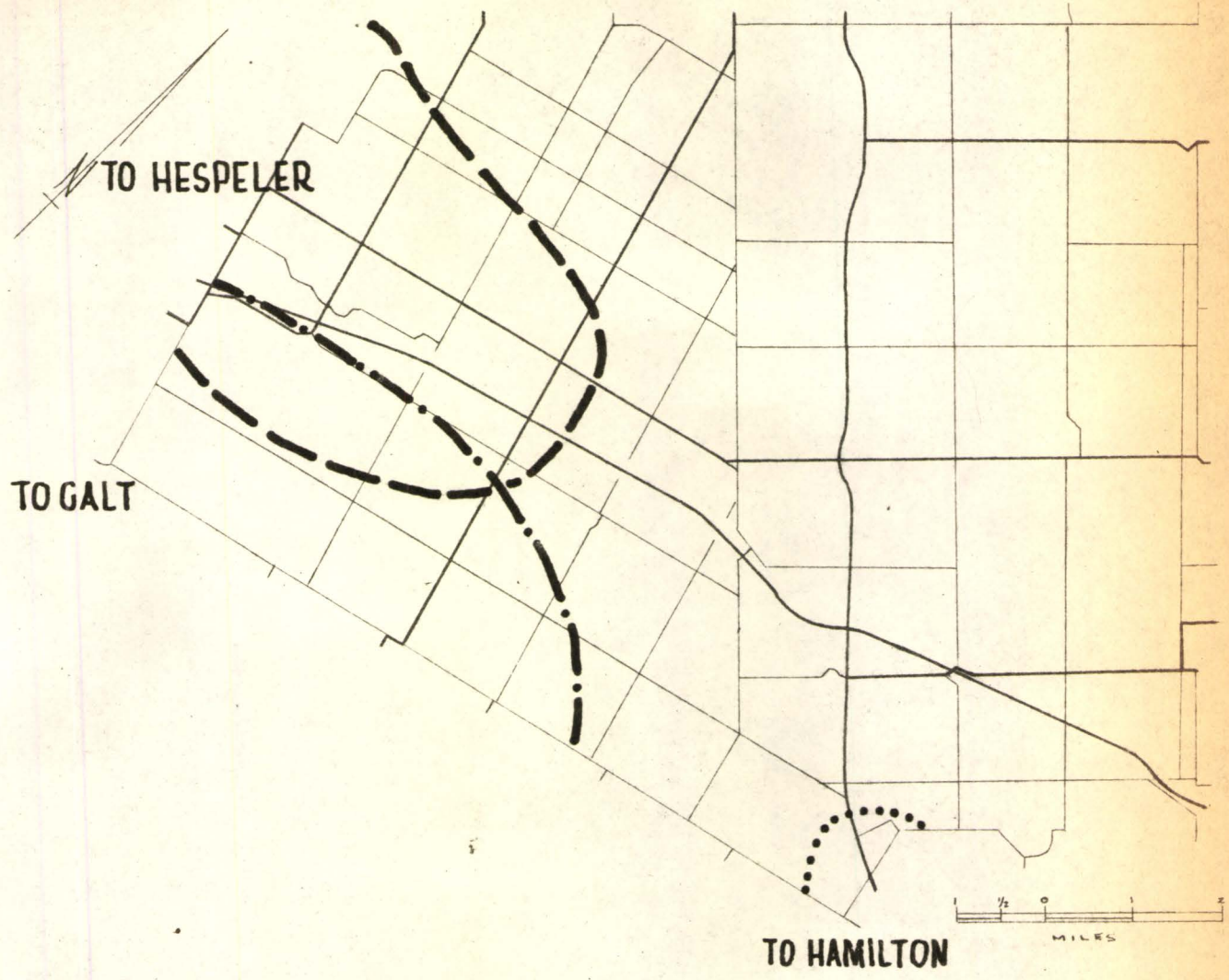
MAIL ROUTES

HINTERLANDS IN TOWNSHIP OF PUSLINCH OF GALT, GUELPH & HESPELER

AS SUGGESTED BY
THREE INDICATORS

FIG. III - 2

ALL OF TOWNSHIP
IN HINTERLAND OF
GUELPH



HINTERLANDS
IN THE
TOWNSHIP OF PUSLINCH
OF
GALT, GUELPH & HESPELER

A SYNTHESIS OF FIG. III-2
AND FIELD ENQUIRIES
FIG. III-3

3. Transportation

Very few of the vehicles that travel the main routes of Puslinch have a destination within the township; rather, they are both coming from and going to outside centres. This has been the case since the earliest days; it was the influence of John Galt that had the Aboukir Road built as a communication from Guelph to Dundas -- through Puslinch.

In the Middle Period, this road carried a large team traffic, which was serviced (in 1863) by ten taverns within Puslinch. Today, the large volume of freight trucking has given a prosperous business to a restaurant at Aberfoyle -- a typical truckers' stop with good meals and reasonable prices.

The Canada Coach Lines supply five return trips from Hamilton to Guelph along this road each day. These coaches will stop on signal, providing Puslinch residents their only public transportation ties with the cities.

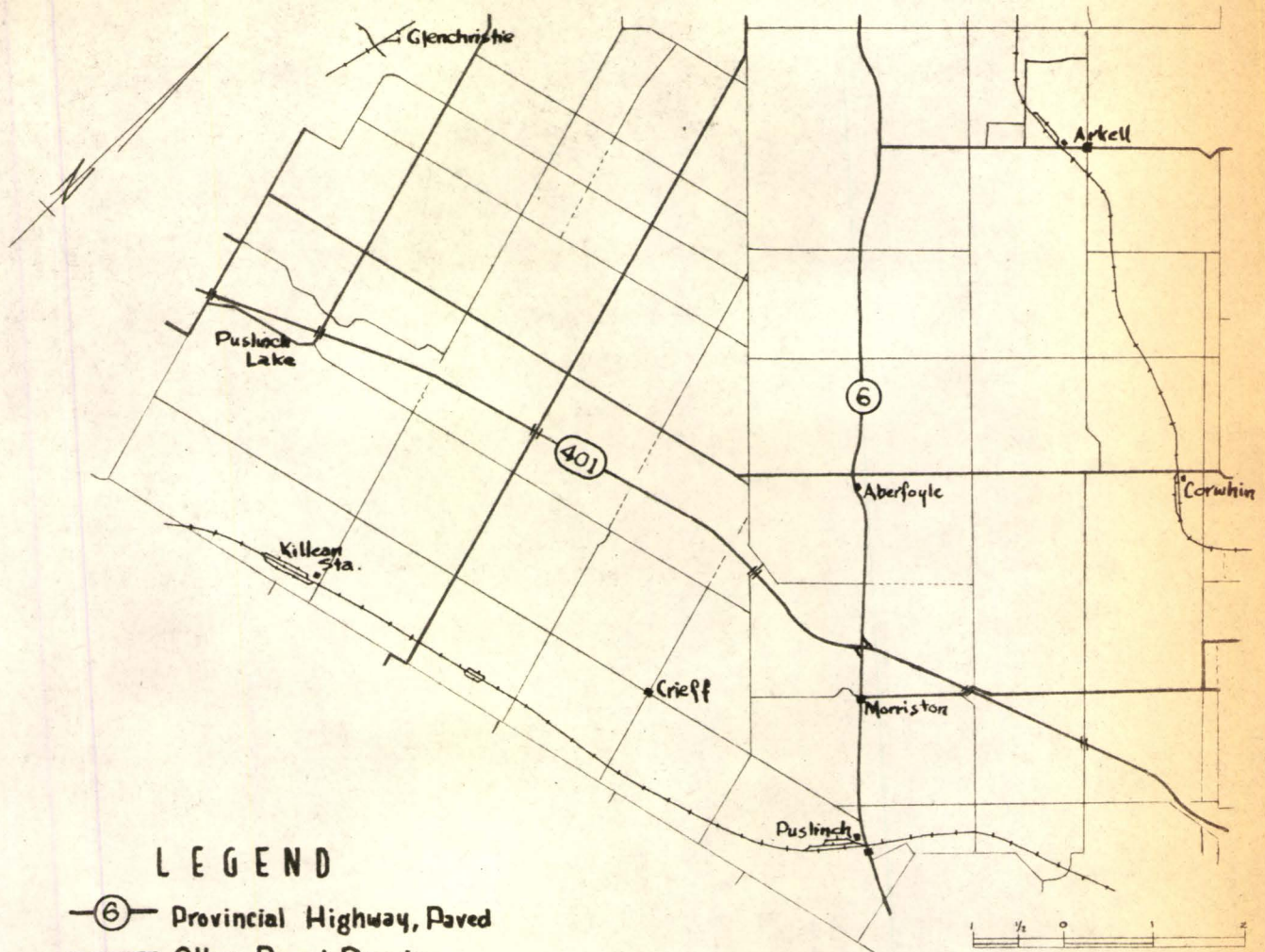
The main line of the Canadian Pacific Railway, linking Toronto and Windsor, also passes through the township. Though, as we have seen, it did much to promote the growth of the hamlet of Puslinch in the Late I Period, it is presently unimportant to the township. A number of through and way freights traverse this line each day; the way freights will pick up or set off cars when necessary -- but it is seldom necessary. Three passenger trains each way pass through Puslinch, but none stop, even on flag.

Highway No. 401, a controlled access, four-laned route, is today's counterpart of the Canadian Pacific Railway. It is definitely not a route used by township residents unless they are travelling to a distant city. The one interchange within Puslinch is at Highway No. 6, where it has brought the township within forty minutes of Toronto.

There are also two lightly-used rail routes through Puslinch. The Canadian Pacific branch from Guelph Junction to Guelph lost passenger service about five years ago, and its freight service is seldom used. A portion of the Canadian National line cuts the corner of Puslinch at Glenchristie. This serves Puslinch's major industry, the lime kilns.

The internal road net of the township (see Map III-4) is well maintained. Even after the most severe winter storm, it is said, the travelled roads are blocked no longer than a day. In the summer, almost all of the township's roads are passable without distress.

In conclusion then, Puslinch is well supplied with transportation routes. The service supplied to Puslinch on the through routes is geared to that which the township requires; the present requirements are small, but the potential remains.



LEGEND

- ⑥ — Provincial Highway, Paved
- Other Paved Roads
- Gravel All-weather Road
- - - Dry-weather Road
- +— Railway

**TOWNSHIP OF PUSLINCH
TRANSPORTATION**

MAP III-4

4. Urbanization

The Township of Puslinch has no large urban centres. The largest population concentration is Morriston, with approximately 200 persons. Aberfoyle has a population of approximately 120, while Arkell has a population of approximately 120 people.

Morrison is located on Highway No. 6 at the intersection with the paved Badenoch Road (see Map III-5 ~~and Plate~~). The village had its start with the gravelling of the Aboukir Road (present Highway No. 6), and with the influx of European Germans about 1850. Its location appears to have been governed mainly by the previous establishment in the neighbourhood of German farming families, and the fact that no other centres existed in the area. Its site is a crossroads; the presence of a large kettle lake may also have been an attraction.

Early plans for the town were grandiose. Streets and town lots were projected far beyond the present settled area.¹ Today it continues as a local centre, offering a confectionary and gas pumps, a general store, a post office, a branch bank, a beauty parlor, a barber shop, and a garage. It is the site of an Evangelical Church.

Many of its buildings along Highway No. 6 and the Badenoch Road are of Middle I age — this village's period of establishment. On the back streets of the western portion of the village, Middle II and Late I structures predominate, suggesting a later growth in this direction. Only four Modern residences are found, one along Highway No. 6, two along

the Badenoch Road, and one rather isolated near the small ball park.

The recent completion of Highway No. 401 may tend to bring more business to the area. The gasoline pumps at the confectionary are seeing more use, as drivers fill up before entering Highway No. 401. American drivers, lost on the new highway, also exit at Merriston to ask directions, usually purchasing gasoline. The Department of Highways have located a large service garage adjacent to the 401 interchange, just north of the town, further increasing the built-up atmosphere.

The Twelve-Mile Creek Conservation Authority has recently acquired the property around the large kettle lake and through the centre of the western town block. Here, they intend a flood control scheme, diverting runoff water into the lake, using it as a detention reservoir so that the water can be let out slowly through a buried culvert. This will eliminate the unsightly swampy conditions now existing in the middle of this block.² Later, the Authority may extend the project to a multiple use, that of a Community Pond -- for recreation and for fire protection.

Aberfoyle also is located on Highway No. 6 (see Map III-6 ~~and Plate~~). It, however, is located at a mill site, where the Galt Creek crosses the road. Here, a grist mill was completed in the Middle I Period. The town was also the site of many taverns, or hotels, in the teaming days of the Aboukir Road, and gained^{an} attenuated form related to their locations. The hamlet today stretches almost a mile along the highway.

The main portion of the community, however, is determined by a vestige of the old main road. In 1848, the Aboukir Road was moved west,

straightening the route and passing below the mill dam.³ A portion of the old road became the village's secondary street, giving it a distinctive "A for Aberfoyle" appearance from the air.

The locating factor of the town, the mill site, has now become a recreation area, and the mill has become an antique shop. The only services that the town still offers to its local area are a butcher shop, a general store, and a garage. A second garage did a thriving business for the few years that Highway No. 401 was under construction, catering to the needs of the highway workers. It is now closed down.

The third community on Highway No. 6 is Puslinch. Though in the early days of the railway, this was a thriving community, it has now only a general store/post office/gasoline pump. Much of its trade is drawn from the south and west.

Four new homes in this small community are a surprising development. This is the divide of the Guelph and Hamilton hinterlands, so little suburban development would be expected. Enquiry revealed that two of the homes had been built to replace one large duplex that had burned. Another two were built for a farmer and for his parents. Thus, the building is not the result of urban expansion. It still reveals, though, some attraction of the community — possibly mere geographic inertia.

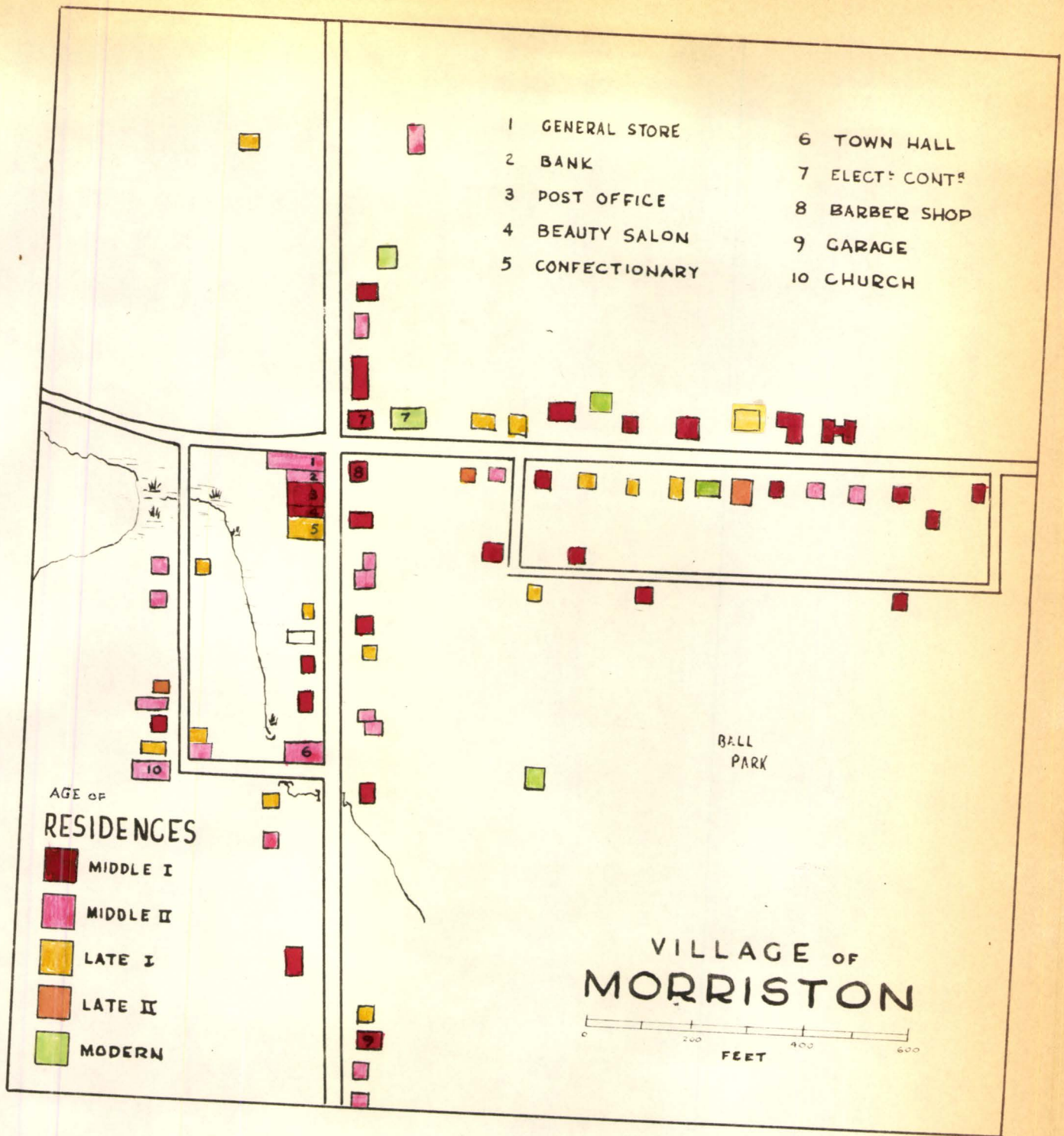
Arkell developed as the community centre for the Arkell Plain. Today, its commercial functions consist merely of a general store and a garage. Its two dozen houses are pleasant and well-kept. A fine rural United Church stands at the crossroads, the core of the community.

The one other community in the township is preserved (though not commercially) by artificial and interesting means -- this is the hamlet of Crieff. In the depression years, Colonel MacLean, of MacLean Publishing fame, purchased a large acreage of the community in order to restore it to its glory of his boyhood days, when his father was minister there. Five of the homes were restored and much beautification was done. Upon his death he left an annuity to provide for a full-time gardener and for the maintenance of the estate. As a result, the hamlet is kept like a rural English village, with fine gardens and manicured lawns right down to the pavement.

As mentioned above, Highway No. 6 has been a through traffic artery since it was opened in 1828. In those years it spread settlement from the newly-founded town of Guelph into the Township of Puslinch. The same is occurring today; strip development is nothing new. Alongside Middle I stone homes we now find ultra-modern residences of people commuting to Guelph. The usual city-edge motels and restaurants have also located here.

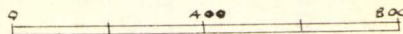
These developments have occurred during the past ten years, very much so within the past three years. Expansion of Guelph to the south was hindered by the River Speed and by a large block of government-owned land, the Ontario Agricultural College; Guelph is expanding rapidly to the north. In Puslinch, many of the subdivision lots are untaken; many of the new homes are unsold. The township clerk points to these facts as evidence that a rapid boom will not take place. But these developments have now jumped the O. A. C. barrier; Guelph's growth -- if it continues -- will

likely turn increasingly to the south, the Township of Puslinch. The fact that the Puslinch entrance to Guelph is now the major entrance, due to the construction of Highway No. 401 to the south, will encourage restaurant and hotel building along this entranceway. And, due to the large Agricultural College block, they cannot build closer to Guelph than within the Township of Puslinch.



MAP III-5

HAMLET OF ABERFOYLE

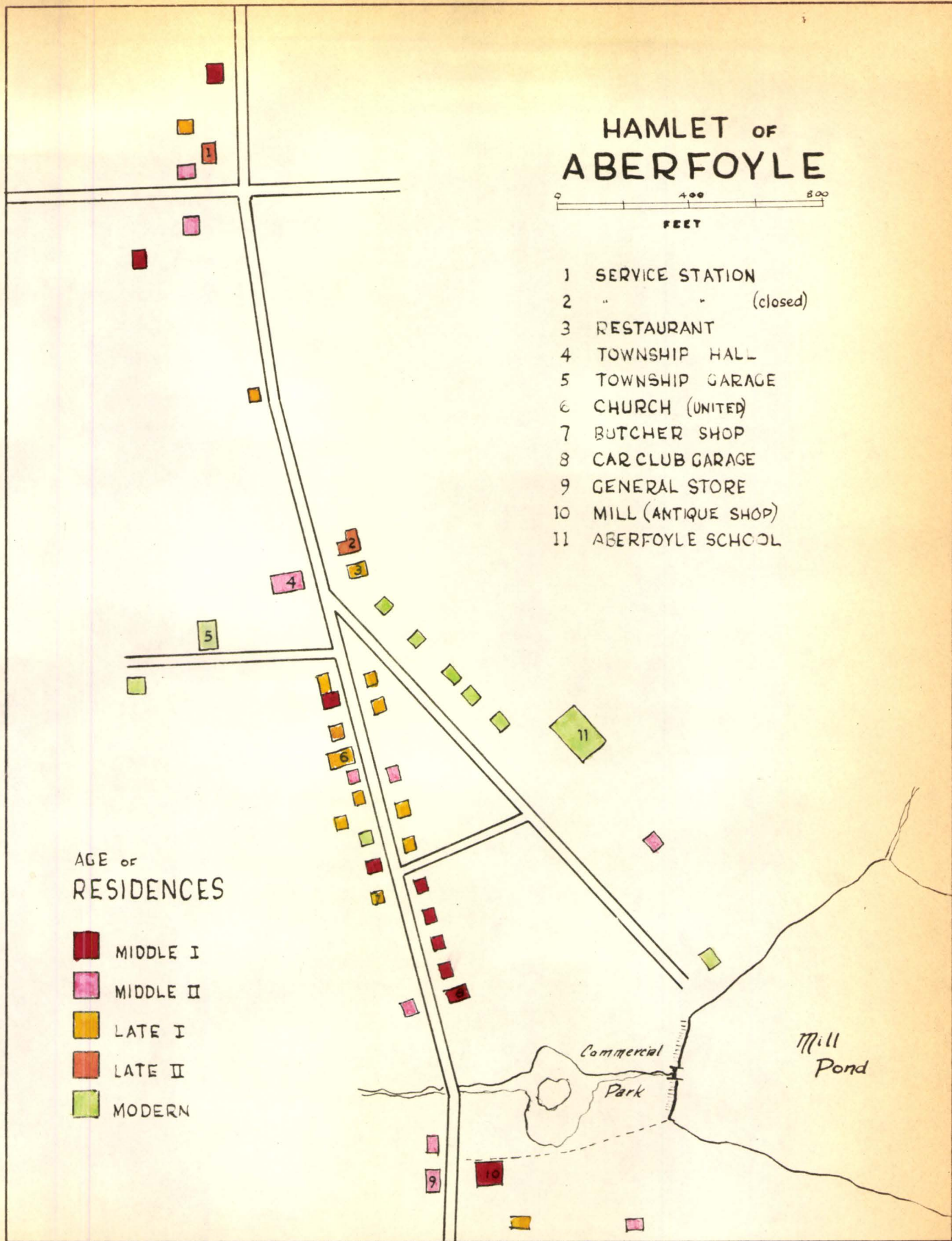


FEET

- 1 SERVICE STATION
- 2 " " (closed)
- 3 RESTAURANT
- 4 TOWNSHIP HALL
- 5 TOWNSHIP GARAGE
- 6 CHURCH (UNITED)
- 7 BUTCHER SHOP
- 8 CAR CLUB GARAGE
- 9 GENERAL STORE
- 10 MILL (ANTIQUE SHOP)
- 11 ABERFOYLE SCHOOL

AGE of RESIDENCES

- MIDDLE I
- MIDDLE II
- LATE I
- LATE II
- MODERN



MAP III-6



Some of the township's first settlers came in from Guelph along the Aboukir Road.

Left, a Middle I home along this road, now Highway No. 6.

Settlers are still coming in along Highway No. 6.

Below, only a stone's throw from the old home on the left, above, is this ultra-modern dwelling.





Motels and restaurants have located in Puslinch at the entrance to Guelph along Highway No. 6.



In the same area, subdivisions and strip developments are catering to the suburbanites.

5. Recreation

Recreation in Puslinch, though for many years present to some extent at Puslinch Lake, has become increasingly important.

The establishments at Puslinch Lake go back to the Middle II Period, when hotels and steamboats gave the lake an air of excitement. Today, the two parks of Butler's Marine and Barber's Beach are being thronged -- in fact, overrun -- by week-end holidayers. Almost all open areas are filled with blistering hot parked cars; crowds munch sandwiches and hotdogs while jostled by fat women in bathing suits and screaming children; the lake is churned white with the propellers of dual outboard motors and water skis. A holiday week-end here is one of utter chaos; many people, though, seem to enjoy such an outing.

The owner of Butler's Marine, though he would divulge no attendance figures, revealed that his establishment covered 35 acres; it employs three men full-time, year-round, and four men part-time in the summer. Two of these attend the gate, two attend the boat rental service at the dock. Evidently, the business is not suffering financially.

The other area, Barber's Beach, is run on a similar basis. It was learned that this enterprise had acquired a large acreage of bush across the First Concession Road. The possibility of a tent camping ground in that area is very strong.

Puslinch Lake is also the site of many summer cottages. About one-half of these were built in the Late I Period; another expansion of

cottages appears to be under way. The cottages go from one extreme to the other: some are little larger than dog-houses (see Plate 19), while others are fine homes. Many of these larger and medium-sized cottages, are, in fact, year-round residences. Their owners enjoy the quiet of the area in the winter, and the cool breezes in the summer. Some are young people who commute to the city, others are older folk who have retired.

Both old quarries into the Beverly Bedrock Plain were much used for swimming until a few years ago. Now, the westerly quarry, Emerald Lake, has modernized its facilities with brick change houses, and offers horseback-riding and picnicking. The old Maloney Quarry, called Clearview, is owned by the Canada Crushed Stone, and has been closed to the public. It is probably good that this has been done, since the quarries are extremely dangerous and have claimed a number of lives. By concentrating the patronage in one quarry, more adequate supervision can be provided.

The Aberfoyle Mill Park offers similar swimming and picnicking facilities. This is a recent development; only a few years ago the area below the dam was cedar swamp; it has now been cleared and dredged to provide a park and swimming. Unfortunately, the wholesale clearing was a little too much for many of the cedars that were left, for they have turned brown from the assault.

A rather novel development occupies Lot 21 of the Gore. This is a zoo, featuring many of the wild animals of the Ontario area. Other odd animals roam the farm upon which the zoo is located. Much reforestation has been carried out on the property. The establishment appears to be

well patronized during the summer weekends.

Horseback-riding has been mentioned in connection with the Emerald Lake development. There are a few other stables in the township; one at Lot 12, Concession VII, is known as Cedarwood Riding School. Arkell is the site of a number of boarding stables. The back roads of the Ninth, Tenth, and Eleventh Concessions are favoured by riders, as they are shady and see little motor traffic.

The Conservation Authorities of the area have in mind a number of further recreational developments. The first may be a Community Pond scheme at Morriston, offering swimming and picnicking at the kettle lake. Another may occur at the proposed reservoir site in Lots 36-37, Concession X, where camping, hiking, and fishing may be offered.⁴ A third scheme would give hiking, camping and picnicking on more than 700 acres around the two quarries in the Gore.⁵ This would be a very worthwhile scheme, for this area is presently wasteland, and, with the exception of the one quarry operated for recreation, is contributing nothing.

In conclusion, then, recreation is an important land use in Puslinch, and promises to be more important. A good amount of the land is suitable for little else, so that such developments are advantageous, especially when combined with reforestation and other conservation schemes.



PUSLINCH LAKE is thronged by summer holidayers.

The lake is crowded with outboard motor boats, and the picnic grounds are packed with cars and people.



Photos courtesy of the
Galt Evening Reporter.



The cottages at
PUSLINCH LAKE are varied.

Here, the simple retreat.



Here, a better-class
residence -- probably
not merely a cottage.

Below, a good number of
the average cottages are
being used year-round.



6. Industry

The only industries of Puslinch are extractive, taking limestone, gravel, and trees. Only one is of any size, and it is isolated from the township proper by the River Speed.

The only industry supplying employment to Puslinch residents is logging. Two or three part-time concerns are cutting posts and poles from the spillways and outwash swamps. These are taken to a yard and are stripped and cut for market. The Aberfoyle Lumber Supply, with a yard in the hamlet, is well situated on Highway No. 6 and does an extensive⁶ business.

The largest industry is the quarry and lime kilns of Canadian Gypsum, Lime and Alabastine at Glenchristie. Here, a seventy-foot face of Guelph dolomite has been cut, and operations are expanding. The dolomite is crushed and charged into kilns for reduction into lime. The product is used for plaster and for mortar. A waste product, chips from the crusher, is sold as road surfacing material.

This large firm located here because a small lime concern was already in operation, so that the nature of the rock was known (it must be of uniform physical characteristics) and a small kiln installation was in use.⁷ This though, was also the case at Christie Quarry on Lot 29 of the Gore, which was purchased by the same company. Both locations also offered excellent rail facilities. The Glenchristie site, however, is adjacent to a major highway; most of the firm's shipments are made by truck.

The second-largest industry within Puslinch is the Aberfoyle Sand and Gravel, located just west of that hamlet and adjacent to (but not connected with) Highway No. 401. This pit was laid out in 1960 as a borrow pit for Highway 401 construction. During 1960, large quantities of granular B sub-base were taken; later, a portable crusher supplied granular A top base.

Recognizing the large amounts of excellent material available here, the present company installed a large permanent crusher, and began extensive selling operations in the fall of 1962. This industry is not likely to supply much employment for Puslinch residents, but it may lead some farmer's sons to take up a part-time trucking business.

A large gravel concern would have begun operations on the Arkell Plain if the City of Guelph, fearing disruption of their water supply at the Arkell Springs, had not expropriated the property. Almost all of the outwash plain in the vicinity of their collection gallery (Lot 4 Concession X) is now owned by the city.

This then, is the extent of the Puslinch industry; most of it is small, and all of it is extractive.

The pit of the
ABERFOYLE SAND and GRAVEL
began as a borrow-pit for
Highway No. 401 construction
in the summer of 1959; right,
the base line is laid out to
locate what was intended only
as a small borrow pit.

In the fall of 1962,
below, the present company
began operations with a large
modern crusher and washer
unit, and with workings spread
over a considerable area.



7. The Land Use Map

Land Use mapping of the more than 96 square miles of the Township of Puslinch was carried out during the summer and fall of 1962. It had been hoped that the full area could be covered in detail in the field; time did not permit this, however, and only 54 square miles were mapped in this manner (see inset map, p.139, and full land-use map on same page).

The roads of the township were traversed by vehicle. Fields that could be seen, but whose use could not be readily determined by the naked eye, were scanned by telescope.

As geophysicists read a base station before and after a day's magnetometer mapping, so certain known-use fields on the route to Puslinch were observed each week before land use mapping was carried out in the township. In this way changes in crop maturity (showing as colour and texture), which would affect identification of distant fields, were noted. If all land use mapping had been carried out in a single week, this would not have been necessary, but, as noted, the mapping of Puslinch was carried out over the summer and fall, on weekends only.

When fields could not be identified from the road, even with the aid of a telescope, a traverse was made on foot until a positive identification could be made. Thus, in the area designated as field mapped in 1962, there should be less than a five-percent error.

Over the remaining 42 square miles of the township, land use

mapping was carried out by interpretation of 1 in. to 1320 ft. stereo-pair air photos taken in 1955. Since these photos (in reduced scale mosaic form) were used as the base for the 1962 field mapping, it was possible to observe land use changes after these seven years while doing field mapping.

The most common change was to find hay or improved pasture taking the place of a grain crop, and vice-versa. This is the normal crop rotation scheme. Though some farms which showed natural grasses pasture in 1955 were being cropped in 1962, more cases were found where a farm cropped in 1955 was idle in 1962. Both latter cases, though, were few enough in number in the areas field mapped in 1962 to allow the use of the 1955 photos for the completion of the land use map.

Aerial photo mosaics at a scale of one inch to one mile were used as a base for both mapping techniques. A sheet of "Kodatrace" was laid over these, upon which land use was indicated by colours. This was found to be a legible and efficient method of land use mapping. It is particularly useful in areas where field-boundary changes have occurred, since no pre-drawn boundaries need be erased. By using the photos directly one is also less likely to become confused or "lost".

To determine the land use classification to be used, a trial line was run the length of the township along the Front of the Ninth Concession, noting land uses in the front fields on each side of the road. This line was chosen since it cut normal to the major physiographic features. A trial classification was set up and was tested along the line between Lots 15 and 16 in the Western Survey -- also a line cutting the major

physiographic features. Additions, deletions, and modifications were made to the system. The land use classification was then applied to the township one concession block at a time.

The Land Use Classification

The classification is custom-tailored to the Township of Puslinch. It is also closely in accordance with the system most generally used for township land use mapping, but differences exist in the classifications for hay and pastures, which are of great importance in Puslinch. The distinction between hay and improved pasture is omitted, since it is felt that this distinction is artificial. Some farmers use the same field in the same season for both hay and pasture. The designation "improved hay-pasture" is used here.

Eight classes of land use are represented:

| | |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>Non-Agricultural land</u> | any non-farm use; villages, non-farm dwellings, quarries, gravel pits, recreational areas, etc. Distinctly urban uses such as towns and dwellings shown as red, other non-agricultural uses shown as pink. |
| <u>Agricultural land</u> | |
| Grains | Oats, winter wheat, barley, oats and barley. Shown as light yellow. |
| Corn | Differentiated from grains due to its row planting, conducive to erosion. Could not be recognized on air photos ⁸ and thus could not be generally mapped in areas interpreted in this manner. Shown as orange. |
| Improved Hay-pasture | A seeded crop used for hay or for pasture. Recognized in the field by a high percentage of legumes. Recognized on air photos by a dark tone or by swath marks. Shown as blue. |

| | |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Natural grasses pasture | Canada Bluegrass (and usually many weeds). This is arable land not under crop. May be used for grazing or may be idle. Seen as medium grey on air photos. Shown as sage green. |
| Permanent rough pasture | Land not usually arable for modern machinery. Natural grasses. (If hilly or stoney land has been broken and seeded to a pasture mixture, it is classed as Improved hay-pasture). Seen as rough land with light-grey tone on air photos. Shown as chrome green. |
| Special Crops | Commercial orchards, root crops, nurseries. Shown as violet. |
| <u>Forest land</u> | Forest cover, including swamp and scrub. (Further differentiated on Forest Cover Map, p. 146). Shown as olive green. |

Roads and water bodies are shown in white.

Recommendations for future land use studies

In a township as large and as rolling as Puslinch, complete field land use mapping is definitely a mis-use of precious time. Where air photos are available from, say, the past ten years, these should be studied, and from them a land use map prepared. Then, a number of sample blocks in differing land use and physiographic areas should be chosen, and intensively studied in the field.

Every farmer in each block should be interviewed; his land should be examined. Tests to determine amount of topsoil erosion and soil depletion should be carried out on as many well-chosen fields as possible.

Thus, from aerial photos, the student would obtain an extensive knowledge of the township; from sample blocks, he would obtain an intensive knowledge of the land and of the human factors. In this way he should be well-prepared to comment upon what is happening in the township.

SOURCE:
 CROSS-HATCHED AREA
 FIELD-MAPPED 1962
 REMAINING AREA from
 AIR PHOTOS 1955

- LEGEND**
- GRAINS (except corn)
 - CORN
 - HAY-PASTURE -IMPROVED
 - PASTURE - NATURAL GRASSES
 - PASTURE - PERMANENT ROUGH
 - SPECIAL CROPS (orchards, roots, nurseries)
 - FOREST (see "FOREST COVER" map, p. 146)
 - NON-AGRICULTURAL
- X LARGE GRAVEL PIT
X OPERATING QUARRY

- pg 139
- | | |
|------------------------|---------------------------|
| 1 Dept. Highway Garage | 5 Cedar post & pole yards |
| 2 Emerald Lake | 6 Aberfoyle Mill |
| 3 Zoo | 7 Butler's Marine |
| 4 "The Pines" - Club | 8 Barber's Beach |

**TOWNSHIP OF PUSLINCH
 LAND USE**

0 1 2
 Miles



A typical field of "Natural Grasses
Pasture".

Con. X, Lot 16



Here and there, fine crops can be found
even on the stoney moraine.

Con. I, Lot. 20

8. Comments upon the Land Use Map

An attempt is often made to relate land use directly to soils, indicating some sort of geographic determinism. In Puslinch, the actual field use is little related to generalized land features south of the Arkell and Downey Plains. On the Plains, though, a definite concentration of improved hay-pasture can be seen. Few fields are unproductive. This is partially historical; the area has been one of intensive use since earliest settlement. It may have one land relation, however. This soil, the Burford loam, is not inherently fertile; but when fertilizer is applied (and many of the early farmers here were stock breeders) it can be extremely productive. Therefore, its fertility when well managed, combined with its flatness, yields a good farming base.

The area south of these Plains is for the most part hilly. Good land is in smaller areas only. The early farmers of the hills were largely Scots, notorious for their inattention to new and better methods. This land could be easily depleted and eroded if not treated with care. The farmer who resides in these areas today may have land which appears the same as his neighbours'; yet degree of erosion or soil depletion may be serious enough to prevent or discourage good farming. Therefore, the moraine locations especially show spotty patterns of land use, with many fields in natural grasses.

The exact combinations that each farmer uses in his mixed agriculture will determine different land uses for each. Yet each is classed

as a "mixed farm", and in a study such as this, cannot be mapped as anything more particular. For this reason too, the Land Use Map will show a spotty distribution of uses.

There are three cases, though, where definite localizations of certain land uses occur south of the Arkell and Downey Plains.

The first is the area of permanent rough pasture. Where these occur, they are in almost all cases in large blocks, either upon kame deposits (Pleistocene Geology Map, p. 18) or Donnybrook sandy loam (Soils Map, P. 38).

The second area is on the Beverly Bedrock Plain. Here, natural grasses and woodland are almost the exclusive uses mapped, due to extreme droughtiness in the former case, and to saturated conditions in the latter case.

An area of intensive use, emphasizing improved hay-pasture, occurs south and east of Morriston. Here the soil is Guelph loam. The area probably would not stand out except for the presence here of:

- (a) Highway No. 6, and its tendency for fluid milk dairy farms,
- (b) a progressive farmer who operates both his father's farm and his own farm, and has gone intensively into beef cattle production, and
- (c) a hobby farmer who is pouring money into his holding.

Forest cover is dealt with in Chapter III-9, and so will not be discussed here.

The urban concentrations are definitely related to transportation along Highway No. 6. Gravel pits and quarries are, of course, resource-

located. Urbanization and industry have been discussed in Chapters III-4 and III-6 respectively.

In conclusion then, land use does not show a striking accordence with physical factors. The Arkell and Downey Plains are the major possible exceptions. The other areas where there is a relation are small, and the relation could be expected, but in more cases than actually occur. Human factors govern the land use of Puslinch.



The initiative that the individual farmer displays is more important than physical factors in determining agricultural land use. Above is an area of Colwood fine sandy loam; between the fence and the road is a deep drain, and the rest of the land beyond the fence is also drained. This land now supports an excellent crop of oats.



But on the near side of the road, (see left) the land has been abandoned to scrub.

9. Present Forest Cover

The Forest Cover Map, III-8, was compiled from Woodland Reports prepared by the Forestry Section of the Conservation Branch of the Department of Lands and Forests. Survey parties of this Branch visited each area of woodland, mapped and described them as to acreage, cover type, presence of grazing, reproduction, density, and average diameter at breast height. Plantations were given special attention. The woodlands were mapped according to a modified form of the system drawn up by the Society of American Foresters.⁹

The classification used for the forest cover map in this report is a condensed version of this system. The most plentiful forest types for the Puslinch area were first determined. Then, a number of types that bore close relation were consolidated, so that four easily comprehended combination cover types plus scrub and plantations were the final mapping units.

These mapping units, or the elements of the classification, are set forth below.

Maple Beech Type This includes the Sugar Maple and Beech-Sugar Maple types; also includes the few stands of Beech, of Hemlock, and of Sugar Maple-Basswood. This Type is found on the well drained areas of moraines, pushed to the back of the farms as small woodlots. Only on extremely rough topography is this type found either more extensively or in a different location than a small woodlot at the back of a farm.

Elm-Soft Maple Type This includes White Elm, with or without Silver Maple which is considered indicative of a wetter site. Hickory and Ash may occur in small quantities. This Type is found in swampy depressions on the moraine and in interdrumlin swales. Thus it is not found as definite woodlots; rather it occurs in areas too wet for agriculture. It is not important commercially, and will become even less so as the Dutch Elm Disease takes its toll.

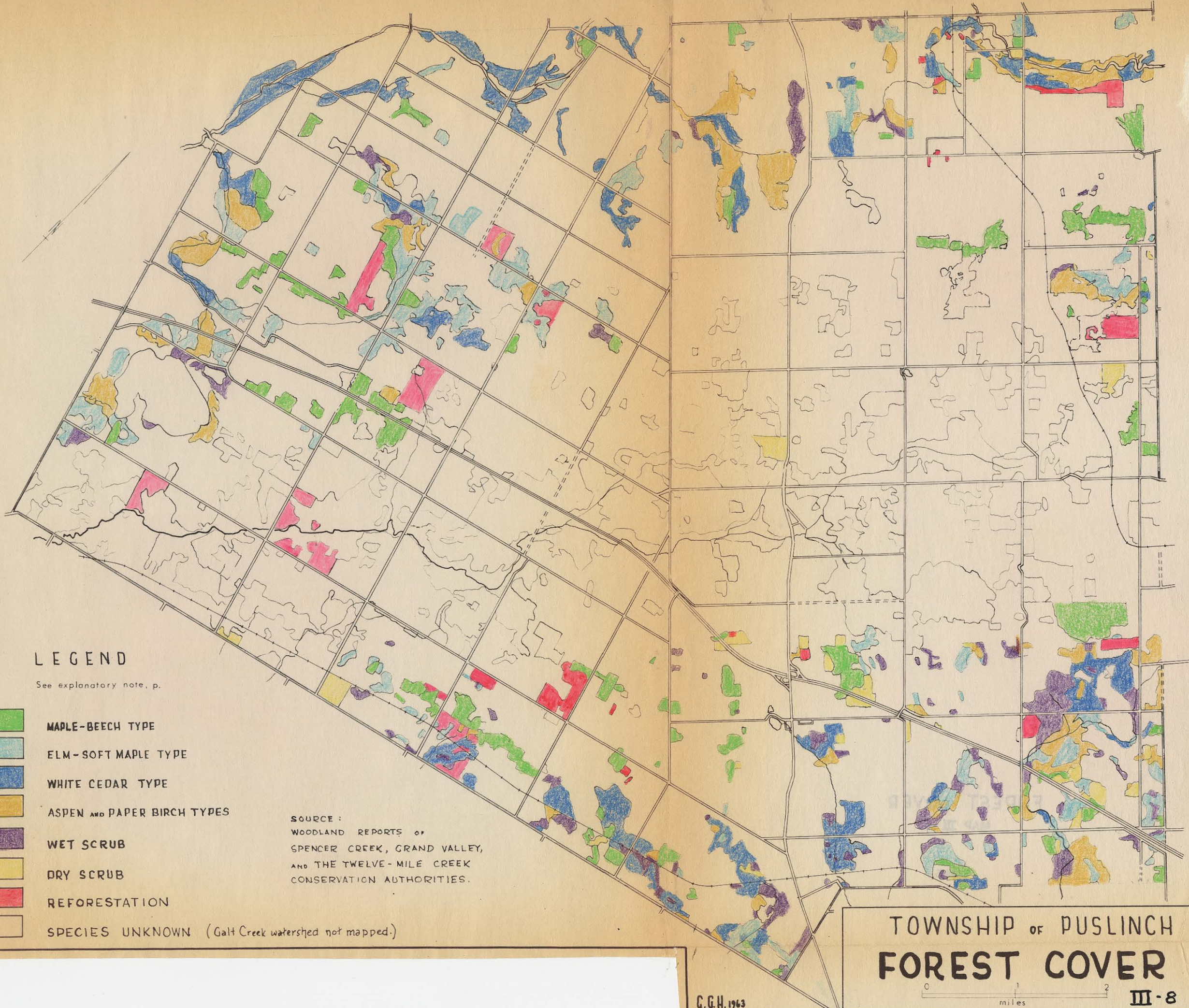
White Cedar Type This is predominantly White Cedar. It is found in relatively large areas, usually on muck soils on outwash and spillway deposits. Thus it is definitely not on agricultural land, and its boundaries are little determined by man. This is the most used commercial species in Puslinch, supplying a number of logging enterprises with fence posts and poles.

Aspen and Paper Birch Types These are both types which move into an area after clear-cutting or fire. They are not commercial species in Puslinch, and tend to suppress the growth of more valuable species. They represent extremely poor use of land.

Wet Scrub This is small timber and scrub plants on wet land. These may be sites too wet for most forest vegetation, or may represent areas of complete clearing of wetland forest. The large area of this type in the Badenoch Swamp, Lot 30, Con. X, was once cleared for agriculture, for the field boundaries can still be seen on air photos. Wet Scrub, of course has no commercial value, and should be planted to a wetland forest such as White Cedar.

Dry Scrub This Type represents agricultural land returning to forest. It is the non-commercial species, however, that appear first, and tend to suppress the growth of the more valuable species. These areas should be replanted -- possibly with a fast-growing softwood such as Red Pine.

Plantations These are found mostly on the moraine. They are composed largely of Red Pine for poles and lumber and Scotch Pine for Christmas Trees. Reforestation in Puslinch is hearteningly common, though, of course it should be even more so.



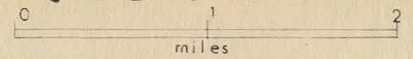
LEGEND

See explanatory note, p.

- MAPLE-BEECH TYPE
- ELM-SOFT MAPLE TYPE
- WHITE CEDAR TYPE
- ASPEN AND PAPER BIRCH TYPES
- WET SCRUB
- DRY SCRUB
- REFORESTATION
- SPECIES UNKNOWN (Galt Creek watershed not mapped.)

SOURCE :
WOODLAND REPORTS OF
SPENCER CREEK, GRAND VALLEY,
AND THE TWELVE-MILE CREEK
CONSERVATION AUTHORITIES.

TOWNSHIP OF PUSLINCH
FOREST COVER





THE BADENOCH SWAMP, a coincidence of inter-drumlin swale and shallow bedrock syncline. A classical example of WET SCRUB. On air photos, field boundaries can be seen over much of the area, indicating that it was once farmed. Some of it has been planted as part of the Wellington County Forest (see right, distance).



Above, a plantation of Scotch Pine
for Christmas trees, now owned by the
Grand Valley Conservation Authority.
Con. 3 Lot 16



Above, pine will grow
to great size, even on kame.
Marker is one foot long.
Con. VII, L 27.



Left, a Maple-Beech
woodlot on the Galt Moraine.

Con. IX Lot 21.

10. The Farming

The majority of the operating farms in Puslinch are of the mixed, or general, type. The pursuits of the general farmer can be put into two classes: the economy of the weekly or semi-weekly cheque, and the economy which yields large returns, but only once or twice a year. Each general farmer will have one or more products in each of these two classes.

The latter economy, which yields the large but infrequent cheque, is usually represented by beef cattle production. Some cattle are bought as feeder cattle — from the West, or from the Fergus area — to be fattened in Puslinch for from six to fifteen months. Others breed their own cattle, and market them occasionally at Toronto, Kitchener, or Ancaster.

The land use of this economy shows much area in hay and pasture if the cattle are being bred, or much land in corn, grain, and hay if the cattle are being quickly fattened.

The weekly or semi-weekly "pay-cheque", so to speak, may be gained from many and varied endeavours. Probably the most popular in Puslinch is that of swine.¹⁰ The farmer breeds them, then markets them two or three times a month at the Ontario Hog Producers' assembly yard in Kitchener. Most of the Puslinch swine producers purchase their feed, ready-mixed and ground. If the producer has some cows, as he generally does,¹¹ the skim milk is also fed to the pigs.

Dairying too, provides a steady income. Fluid milk production is better classed as a specialty, and will be discussed shortly. The general farmer with some dairy cattle usually separates their milk into cream and skim milk. The skim milk is then fed to swine, while the cream is picked up by creameries from nearby urban centres — some goes as far as Milton. The dairy economy requires much hay and pasture, as well as grain for winter feed. This is usually reflected in the land use.¹²

A number of Puslinch farmers find a supplementary income in poultry. Broilers are considered a specialty, but eggs for human consumption and for breeding are produced by many general farmers. The breeding eggs command a high price, and are purchased by breeders in Galt and Burlington. Eggs for consumption are collected by a Puslinch village man over a fifteen-mile radius, and are marketed in Toronto. Hens consume large amounts of grain. Much of this is grown on the farm (in the case of the general farm), but much must also be purchased from feed mills.

Sheep can also be a steady income source, but due to their need for attention and protection from vicious dogs, and the special knowledge which their managers require, they are not common in Puslinch as a secondary source of income; the few sheep specialists though, appear to be earning a satisfactory income.

In some cases — not many in Puslinch — one of these pursuits, in either of the two classes, becomes dominant. The farm is then not a general, but a specialty farm. Such farms are the fluid milk farm, the beef cattle farm, the sheep farm, and the broiler farm.

The fluid milk producers are concentrated along the paved roads, especially Highway No. 6. All are required to instal bulk coolers, and all hold a contract. They must meet a minimum production; excess may be purchased by the dairy at a reduced rate. Contracts in Puslinch are with Guelph, Toronto, or Hamilton dairies -- depending upon distance, but probably more upon the availability of a contract. Tank trucks collect the cooled milk every two days. These are large and heavy vehicles, and so prefer to stay on good roads; the farm lane must be kept in excellent repair, for delays are costly. The fluid milk dairy farm is clean and efficient. The operator has a large investment and contracts to fulfil; he cannot afford to be slovenly.

The beef farmer, by contrast, need pay little attention to his stock. These are sometimes pastured on large tracts of natural grasses which may be far from the owner's residence. Often he has other occupational interests, and is raising beef as a supplement to his non-farm income. This is not always the case, however. The farmer who brings in large herds of feeder cattle from the west may devote much of his land to the production of corn and grains, and may have a huge capital investment in buildings and equipment.

The farmer who raises broiler chickens is almost independent of the land. The farm itself requires only a few acres, and feed is purchased from mills outside the township. Large urban markets are nearby. This is a type of farming relatively new to Puslinch, but one which may well gain in importance.

Such, then, are the farming types of Puslinch. The only natural region to show any sort of co-relation with farming type is the Beverly

Bedrock Plain, which supports only a few head of beef cattle. The Arkell and Downey Plains show a higher intensity of farming use, but show no preference for farming types.

Thus, the type of farming carried out is decided by the farmer and by markets, not by the land. The land, of course, may set a limit to success, but the initiative that the individual displays is far more important.

Examples

Described below are agricultural examples throughout the township in similar and in differing natural regions.

The Downey and Arkell Plains have always had a high standard of agricultural endeavour. It was here in 1833 that some of Canada's first pure-bred cattle were introduced. This early interest in scientific farming was undoubtedly instrumental in attracting the Ontario Agricultural College to Guelph. The soils here are the Guelph loam, on the moderately-sloping drumlins, and the Burford loam on the smooth and gently-sloping outwash plains. The Guelph loam has a high inherent fertility, but the Burford loam requires much fertilization.

Though there are a few examples of a below-potential land use on these plains, one can see a definite high intensity of land use which coincides with the region. This is one of the few areas in Puslinch where a relation can be found between land use and the natural regions as set down in Book I, pages 58 - 62.

One of the most successful farmers in Puslinch, operator "A", works approximately 200 acres here on the plains. His specialization is

fluid milk, stored in a bulk cooler and shipped by truck every two days to Guelph. The farm is kept about equally in grains and hay-pasture. Close liason is kept with O. A. C. who analyse soil samples and recommend fertilization.

This operator did not inherit a prospering farm unit. When he acquired the land, twenty-five years ago, "its soils would starve you"; luckily the gently-sloping Burford loams are not subject to severe erosion even when poorly managed, so that by proper management, the farm could be built back up in fertility. The soils now give high yields.

Nearby, Ontario Agricultural College operates a large tract as an experimental farm. Their land is kept largely in hay-pasture; this is their recommendation for most of the land in Puslinch, especially the Dumfries loam.

Operator "B" owns 250 acres, part of which is on the Paris Moraine and part on the Arkell Plain. The Arkell Plain section is Burford loam kept in fine fields of grains and hay-pasture; the Paris Moraine section is Dumfries loam (which is "exceedingly stoney" and has "very steep slopes") and is kept in natural grasses as rough pasture land.

The economy is beef cattle and swine. Some of the cattle are completely bred and raised right on the farm, others are purchased from the West in the fall, wintered, grassed on the Paris moraine the next summer, then finished during the winter. They are marketed at the Toronto Exchange, at Kitchener, or to the nearby Ontario Reformatory at Guelph. Hay and some grains from the farm provide winter feed for the seventy head of cattle. Some wheat is sown each year since it gives the animals

a change of feed, and makes better use of moisture from the often droughty Burford loam. Generally about fifty hogs are kept as a secondary income. These are fed on home-grown grains, and concentrates and mash purchased in Guelph. The hogs are marketed at the Ontario Hog Producers' assembly yard at Kitchener.

A region almost identical to the Arkell and Downey Plains in physical characteristics is the Aberfoyle Plain. Yet here one can find examples of nearly all intensities of land use.

Farm operator "C" with 200 acres raises pigs and beef cattle. One of his 100 acre farms (with outbuildings, but no house) is kept exclusively in grains (oats, wheat and corn), while the home farm (with an excellent Middle II stone home) is kept almost exclusively in hay-pasture. Farm power is supplied by at least one diesel tractor. This is evidently a prospering operation.

But just down the road, farm "D" is only one-half cultivated. One field is in oats, while the remainder of cultivated land is hay-pasture. It was operated as a fluid milk farm until a short time ago, when the farmer, for personal reasons, decided to retire and to graze only a few head of young cattle. He sells some of these occasionally merely to pay taxes on the land. The farm, with its fine Middle II stone home, is paid for, so there is little need to continue working it.

Nearby, farmer "E" with land both on the Aberfoyle Plain and the Galt moraine has turned his horses out to pasture and let the farm go to natural grasses. He has passed the age of working the land, and will retire on the homestead.

In other natural regions too, one sees great contrasts, even in adjacent farms. In the eastern Paris Moraine region of the township, on soil which is classed as Dumfries loam, but which is so hilly and stoney as to suggest its classification as Donnybrook, is farm "F", with a Middle II stone house, and land kept mostly in hay-pasture, but with some grain. The economy is one of beef cattle and hogs; usually about thirty head of cattle and the same number of swine are kept. The cattle are marketed at Toronto or to the Ontario Reformatory. Though only a small acreage of mixed small grains is grown, the yields are said to be such that little feed needs to be purchased.

But behind this farm, on similar land, is farm "G", with the ruins of a Middle II stone house and of a huge stone barn. The land is in natural grasses, upon which beef cattle graze. Much of the land was never fenced into fields; what fences there are, are of stone.

Granted, probably neither of these farms should have been cleared from the forest; but in one case the owner has kept his farm well and proudly, the other has abandoned his to the elements (and the few head of cattle that it will carry).

In the western portion of the Galt Moraine region, farm "H" is another example of beef cattle grazing upon natural grasses. Here though, two fields have been planted to an improved hay-pasture. Again, the operator is not interested in making a prosperous farm; he is merely interested in "keeping the wolf from the door".

But adjacent, on similar land, we find the highly efficient and scientific operation, "J". Everything that is done here is done for a

reason — in fact, for several reasons. Every operation is integrated with other operations. The farm was purchased seventeen years ago — when it had been almost abandoned — and has been built up by the application of proper practices to the point where it is lucrative enough that the farmer's son is joining him in its operation.

Their Late I home is comfortable, spacious, well-furnished and well-kept. The farm covers 150 acres, but is split into three almost equal sections — once by the road, and once by the railway. This, in itself, would be enough to discourage many less industrious farmers. But an investigation of the operations here reveal what can be done on the Galt Moraine.

The land on the other side of the road is used almost exclusively for grains. The railway, he says, is no real hindrance; the 100 acres of the home farm is fairly evenly divided between hay-pasture and grains. One field along a water-course is left in permanent natural-grass pasture.

This farmer pursues three economies: poultry, dairy cattle and swine.

His 4,000 laying hens are fed on 60% mash (which he buys from a Galt mill), and 40% of his own unground grain (this takes most of the grain from his farm). The eggs are sold for breeding purposes to a breeder in Galt, who collects them at least once a week. When the hens get old, they are sold in Streetsville or Toronto.

He has thirty head of Holstein dairy cattle, fifteen of them in milk. In the summer, they are fed on areas of pasture and are later allowed to graze on grain stubble. In the winter, they receive some grain,

but feed mostly on hay. His hay is an alfalfa mixture which, he states, has an advantage over other legumes such as clover because:

- (a) it gives better yields on second and third cuttings,
- (b) it does better on dry soils, and
- (c) like clover, it is a lime-loving crop.

These are all advantageous attributes when related to the high lime, often droughty, Dumfries loam upon which he operates. A field is allowed to stay in alfalfa for four years, after which it is plowed and used for grain for one to three years.

Most of his grain crop is oats, but wheat is sometimes planted because:

- (a) it requires different nutrients from the soil,
- (b) it gives the animals a change of feed, and
- (c) it requires a different harvest time, helping to spread the work slightly.

The produce from the dairy cattle is separated into skim milk and cream. The skim milk is used on the farm as feed for the swine, while the cream is collected once every two or three days by a creamery in Milton. His surplus young cattle and all bulls are marketed occasionally for veal at markets in Ancaster.

He keeps also about 100 swine. These are fed on skim milk -- as mentioned -- and on pre-mixed grains purchased at a Galt mill. They are marketed once every two weeks at the Ontario Hog Producers' assembly yard at Kitchener.

Though corn fields are often found on the better farms of the

township, this operator grows no corn. Rather than lay out large sums for corn-processing machinery, he feels that it is more efficient to purchase feed, ground and mixed to his exact specifications, at the mill.

In the Badenoch Drumlin Field, the well-drained Guelph loam is inherently the most fertile soil in the township. Its often steep slopes, however, call for enlightened farming practices. Interdrumlin drainage is poor, and these areas are frequently left in wet forest or scrub.

Most of the farms here are of the general type. Thus, example "K" keeps hogs, cattle and poultry. The hogs are marketed at Kitchener, the steers are sent to Toronto for baby beef, and the eggs are sold to a breeder in Burlington. The cows are milked to supply liquid feed for the hogs; grain feeds are raised on the farm and, in addition, are purchased from mills in Moffat, Freelon, or Guelph. About one-third of this particular farm is in wet-land forest, much of it Elm having little commercial value.

Yet another nearby owner, operator "L", having 100 acres of his own, has recently acquired his father's 100 acres as well. He now devotes his father's farm nearly equally to leguminous hay and to corn. Almost one-half of his home farm is in wet-land forest and scrub; the other half is given to grains and pastures. In 1960 he had 50 head of beef cattle; in 1961 he had 200 head; shortly he hopes to increase this number to 400 head.

Conclusions

These examples should be enough to show that in few cases can the present type of farming or quality of farming be related to natural land

characteristics. The Beverly Bedrock Plain is an exception where the land was so much of a handicap as to exclude modern farming almost completely. The relation of quality farming to the Arkell and Downey Plains is probably as much historically-related as land-related.

It should be added, however, that "natural land characteristics" refer to regional characteristics of land which is in a natural state; man has modified these characteristics, sometimes to the better, but often to the worse (i.e. erosion). It is difficult to determine where he has done so in a study such as this which covers a large area in a short time.

If such things as soil fertility and degree of topsoil erosion could be determined for each field, a better relation might be found between land and land use. This might be as important as, for instance, that the farmer's son had left for the city, and the farmer had decided to retire on his homestead. It might even be found to be the reason for the "human factors". Possibly the farmer, who was able to build up a prosperous farm, did so on soils that were not quite as badly eroded as his neighbours'. This is impossible to assess without intensive methods, extensively applied.



Small, forest-enclosed fields dotted with stone piles are typical of the moraines.

Con. X, Lot 10.



But on the Aberfoyle Outwash Plain, large fields with cedar swamp on the horizon are characteristic.

Con. I, Lot 20.



Some farmers purchase beef cattle from the West, and fatten them for market. Above, a high intensity cattle-feeding farm.

Con. IX, Lot 37.



Others breed and raise cattle on their own farm.

Left, young dairy cattle on the western Galt Moraine.

11. The Present Problem

In the author's opinion, the problem in Puslinch today is the large amount of arable land not seeded. This is graphically shown on Map III-9. Where these unseeded lands occur as one field on a farm, they usually indicate summer fallow, which is not a problem; but where all of a farm, or even one-half of a farm, has been allowed to go to Canadian Bluegrass (and usually many weeds), then some lack of interest in farming is evident.

What then, is the cause? Since these unseeded lands occur more upon the moraines than upon the Arkell or Downey Plains, it might be concluded that they are partially caused by poor land. This is no doubt a contributing factor, but there are areas of good land that are seeing the same poor use.

In some cases these can be attributed to speculation (as along Highway No. 6 in the north of the township), or to the disruptive influence of Highway No. 401. In the eastern part of the township, this highway was forced to cut diagonally across farms. The farms were purchased by the Department of Highways, and were either left idle or were leased back until this year. These lands are now being auctioned, and should return to better uses. Large blocks of unseeded arable land occur around Morriston and around the gravel pit on the Aberfoyle Plain. These may be instances of speculation, but other acceptable human reasons have been uncovered for many of these instances of below-potential use.

This Puslinch problem is closely related to the age of the farmers. Interview after interview impressed the author with the extent of this factor. Farmers throughout Puslinch are getting "used up". Their farms are paid for; their taxes are low enough that they can retire on savings or by grazing a few head of beef cattle. Sons have taken jobs in the cities. The older farm folks do not want to leave the homestead this late in life, so the farm is let go to natural grasses.

A staff member at the Ontario Agricultural College surveyed (from curiosity) one concession block in the western corner of Puslinch. Here, he found an average age of farmer of about seventy years; the youngest was fifty-five.

The only recent year for which a census age breakdown for Puslinch could be found was 1951 (see Fig. III-10). Unfortunately, this includes non-farm population, which, according to Fig. II-9, following p. 111, made up forty per cent of the township's population in that year. This group would include many young people commuting to Guelph, and their families. Even so, note the large numbers of older people on the graph. Almost 200 people in Puslinch were over the age of seventy. If these are considered as all farm people¹³ then one in nine were over that age. And in 1963, the problem can be considered to be worse; since few young people are coming in to take up farming, twelve years can be added to most of 1951 ages.

Areas of non-commercial forest in the township are also relatively large. Unfortunately, it was not possible to show these on Map III-9,

"Unproductive Land", since species were not known for the whole township. But in the areas in which species have been mapped (Forest Cover Map III-8, p. 146), non-commercial species (Elm-Soft Maple type, Aspen and Paper Birch types, and Scrub) occupy a considerable proportion of the forest land.

The areas of non-commercial forest are not to be explained by reference to physical reasons. Almost any land will grow commercial trees. They are rather to be explained by purely human and economic reasons. If a farmer will not develop his agricultural land fully, it is hardly expected that he will manage his forest properly. This would account for most of the non-commercial forest areas in Puslinch. Even potentially commercial forests are being ruined by grazing.¹⁴ But why are not the better farmers managing their forests for profit?

The farm woodlots of days-gone-by were a source of firewood for the farm. With the increasing use of coal and oil for heating, the use of the woodlot dwindled, and it became a relic -- now merely providing shade for cattle. Most woodlots, especially the most valuable -- the Maple-beech types -- were too small to warrant management by the farmer as a commercial forest. The amount of profit to be realized from each, he felt, was not worth all the time that must be spent to learn to manage them and to inquire about marketing. What one does not understand, one avoids.

But if all the farmers know that their woodlots can realize them a tidy profit, if they know exactly how to manage them, and if they know that they will have an easy and assured market, then they could manage their small woodlots with little confusion and little time spent. These would be the advantages offered by a farm woodlot co-operative. A mill

in Galt scours all of Southern Ontario for maple, and is finding supplies running low, yet farmers on its own backstep continue to pasture their stands.

The larger areas of bush are also being poorly managed. As trees are removed, none are replanted. Unwanted species thus inhibit the growth of those of commercial value (see Plate 28). Proper woodlot management should be mandatory for the small Southern Ontario operators as it is for the large northern concerns. Cut-over areas should be replanted or underplanted with commercial species. The main reason why more reforestation is not done is because farmers will not realize its profits immediately. But where land is presently unused, and where Conservation Authorities offer a free tree-planting service¹⁵, the land owner has little to lose by carrying out reforestation.

The fact that one finds abandoned gravel pits all over the township is really an insignificant problem of under-development of land when compared to the vast areas of good agricultural land lying idle. Borrow pits for Highway No. 401, however, were back-covered with topsoil, so that they could again be used for agriculture.

The recreational use of land in Puslinch is becoming widespread. Where only a portion of a farm is used in this way, the rest, instead of being left idle, should be put to forest or other conservation uses.

The decline of farming is presently the major problem, but urban expansion looms as a great future problem. Spotty and strip-type suburbanization can lead to large vacancies within concession blocks, and thus

to inefficient servicing. Urban uses can conflict with agricultural uses. This is a particular problem in Puslinch, since the best-used agricultural land is adjacent to Guelph, the only city yet affecting the township with its expansion.

There is another factor that particularly affects Puslinch: this is the increasing popularity of hobby farms. Puslinch has many fine Middle I and Middle II stone homes, attractive to potential "Yonge Street Farmers". These uses of land can, though, be beneficial, since the businessman often has more money to spend upon his farm than has a true farmer. He often hires local people as farm labour, and he often consults government and professional sources to learn the proper management methods. Thus, though he antagonizes the locals, he is often putting money into the township for the sheer pleasure of farming.¹⁶ There are examples, however, where the farm is left in natural grasses, merely so that the owner may survey his estate from horseback each weekend. These hobby farms contribute nothing but taxes. Three or four businessmen have purchased hobby farms in Puslinch during the past summer; it is too early yet to judge their intentions.

Recommendations

- 1 Puslinch must accommodate itself to urban pressures. They are presently manifested in quarries and gravel pits, in recreation, and in suburban expansion. This cannot be allowed to go on haphazardly. It must be directed by intelligent planning. Only in this way can Puslinch prepare for its problems and be ahead of them when they come.

- 2 A farm woodlot co-operative should be set up to work amongst the farmers with only small stands of commercial timber.¹⁷ It should discourage woodlot grazing, and should have the services of a professional forester at its call to set up management schemes. Reliable marketing methods should be established.
- 3 Revitalization of the rural economy consistent with land capability is essential.

Consideration should be given to the establishment of large forest tracts, including whole concession blocks, where the land is too poor for agricultural pursuits and where a large part of the block is already in forest. Replanting should be done wherever necessary. With large blocks in forest, management can be carried out efficiently. These forest blocks would provide much-needed winter work --- a presently neglected facet of the economy.¹⁸

Consideration should be given to the establishment of large community pastures on land suitable only for permanent grass cover or to long rotations of grass.¹⁹ This, like forest, would be set up over large areas. Where practical, the land would be broken, and leguminous pasture seeded. Where deemed unsuited to legumes, proper management of natural grasses (weed control spraying, etc.) would be carried out. Whether pure grass or leguminous, the pasture would be treated with care. The community

pasture would have a veterinary at its call. A nominal charge would be made for each head of cattle pastured per day.

The present high-intensity beef-cattle farms should continue their present operations and expand them if they wish. They are important counterparts of the community pasture program, and are the natural economy for the pockets of good land in the township.

Hobby farming should not necessarily be discouraged. Every stone house should be considered a potential hobby farm. These farms can be well integrated with the community pasture scheme; a hobby farmer will often be only too glad to be able to graze his cattle on good pasture and in the care of a veterinary for the few cents a day that is charged.

No attempt should be made to remove presently producing land from production, but as farms fall idle they should, if their land is poor, be acquired as part of the community pasture or forest scheme.

.....

The Township of Puslinch has the potential of being a model township for Ontario, and possibly for North America. In the suggested scheme of community pastures, large forest blocks, and pockets of high-intensity farming, one may notice a resemblance to Mediaeval European

agriculture. The high-intensity pockets on good land are analogous to the manor and infields, while the pastures and forests are similar to the outfields and forests of Mediaeval Europe.

The settlers of Puslinch came from countries that had just won their freedom from the oppression of the feudal lords. In Puslinch they started a new life, each with his own estate. But the land in this township is not today suited to small farms, especially with all the machinery that each must possess. The settlers had an era of prosperity on virgin soils and while they enjoyed almost unlimited markets; but today Puslinch has depleted soils and faces a stiffly competitive market.

The establishment of the schemes recommended above could well lead to attractive nucleated rural villages, the type of living for which sociologists and town planners have been crying.

The Township of Puslinch has today vast areas that are lying in unproductive uses. If these are taken haphazardly by city dwellers, then Puslinch may lose the finest opportunity it has ever had. Thought and action must come NOW, for events are marching at a pace never before equalled.



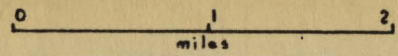
■ ARABLE LANDS NOT SEEDED.

FROM LAND USE MAP No.

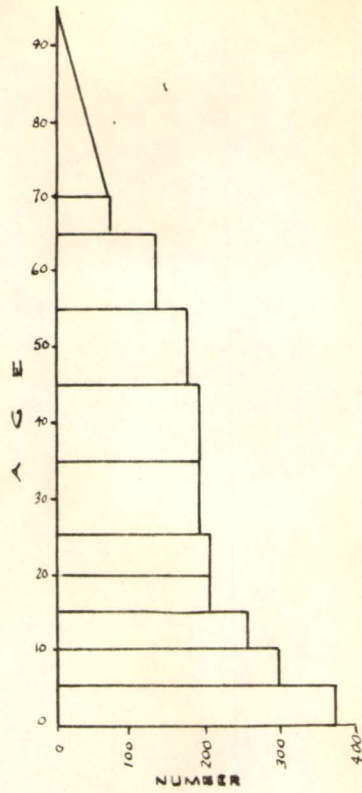
UNDERDEVELOPED LAND

LAND USE FAR BELOW LAND POTENTIAL

C.G.H. 1963



III-9



TOWNSHIP OF PUSLINCH
 AGE STRUCTURE
 1951

Canada Census

C.G.H. 1963

Fig. III-10



Farm woodlots are relics. With pasturing, they are thinned, and eventually only provide shade for cattle.

Con. VIII, Lot. 10.



Left, non-commercial species such as poplar invade after clear-cutting or fire.

Con. VIII, Lot 19.

BOOK FOUR : GENERAL SUMMARY and CONCLUSIONS

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General Summary and Conclusions

The topography of Puslinch is a legacy from the waning stages of the Wisconsin Glaciation of the Pleistocene Period. Two bulky moraines cross the township from northeast to southwest; extensive outwash gravel plains front each on the north. The most northerly ridge, the Paris Moraine, was deposited during a long stand in the ice retreat, and its outwash was laid down as water spilled from it to the well-developed Eramosa-Speed spillway system. The southerly ridge, the Galt Moraine, was partly formed as the ice retreated from the township; but a re-advance of the ice overrode the recession deposits to form the present moraine and the drumlins of the Badenoch Field, south of the moraine. An outwash gravel plain between the two moraines, the Aberfoyle Plain, was a result of outwash both during the recessional and the readvance building of the Galt Moraine.

Upon these predominantly sandy and gravelly materials have formed the soils of Puslinch. With few exceptions these are Grey-Brown Podzolics where the drainage is good, Dark Grey Gleysolics where drainage is poor. Upon the stoney, often steeply-sloping, calcareous till of the moraines, the Dumfries catena has developed; it is well-drained, but low in natural nutrient. On the outwash gravel plains, the Burford catena is found; it is flat, but usually satisfactorily drained, and is also low in natural nutrient. These two catenas cover almost three-quarters of the township. Sandy and gravelly soils and muck have developed on

relatively smaller, but nevertheless considerable areas. The soils are directly related to the parent materials; the only factor introducing a variation is drainage.

These soils and a humid mesothermal climate (Thorntwaite) induced two distinct natural vegetation types in Puslinch. On the poorly-drained sites the most common species was White Cedar, though Spruce and Tamarack appeared if the micro-climate was slightly cooler. But on the satisfactorily-drained soils, Maple, Beech, and Basswood were the predominant species; others such as Hemlock, Ash, and Oak commonly intruded in smaller quantities. Where the soil was especially sandy or gravelly, White Pine was common; where poor drainage occurred on the moraine, Elm often was found. Thus, as it is with soil development, drainage is the most important factor in determining local variation in natural vegetation.

According to our present evidence in Puslinch (which is admittedly sparse), aboriginal man was governed by physical geography; the favourable conditions for habitation can be stated, and there, and nowhere else, traces of his occupance can be found.

But European man came to settle, and took very nearly all of the township. In many cases, the early settler came to see the land, and then purchased some of the most hilly, gravelly, and sandy. Even in those times, the surveyor wrote "inferior land". Either the settler was not interested in the quality of the land or, like the natural processes before him -- soils and vegetation -- he found drainage the ruling factor. Possibly he would bear difficulties so long as poor drainage was not one of them. The settler took the land as his own, pushed back the virgin forest, and set the soil to the plow.

Having opened the land and passing from mere subsistence, the farmer of Puslinch entered world trade with wheat as good as any in Canada. For this market he was competing with all the older townships of the country, but such was the demand that Puslinch could sell all the wheat it could grow. Township roads were improved, hamlets sprung up, and the prospering farmer began to build a "mansion" of stone. When the American West began to produce competing wheat, Puslinch supplemented its wheat with peas, barley and some livestock; the United States produced no equal to the Canadian brewing barley. While prospering in world trade, Puslinch had little concern with its older brother townships; its lifeline was the Aboukir Road, which led to the ports on Lake Ontario, and thence to the world.

But while Puslinch was thus occupied, the Canadian Pacific Railway was driven into the Canadian West; Western wheat won the markets. The United States became concerned with its vast imports of Canadian agricultural products, and cut its market from Canada with the McKinley Tariff of 1890. Puslinch had lost its markets for wheat, for peas and for barley.

During the years that Puslinch had been engaged in world trade, the other townships of Southern Ontario had been setting up large urban centres. The communities in Puslinch never passed the village stage, since they had a late start, and were in no special way favorably located. But the towns on the shores of Lake Ontario, and in older settled areas had grown into cities; their population must be fed. Puslinch was charitably invited to help; the gay young girl of the '50's and '70's became a servant in her own household.

The railway in the 1880's tied the township firmly to Southern Ontario. The urban centres slowly began to lose any importance they may have had. Puslinch had been losing population since the 1860's. The farmers that were left adopted a mixed farming with the emphasis upon livestock.

The township today differs little in its agricultural type from the turn of the century. It still supplies Southern Ontario with food, but other areas can do it more cheaply; large areas of land lie in natural grasses, and are used either little or not at all. As well, it gives crushed stone, lime, and poles. It offers recreation for the city hordes, and a place to "farm" for the businessman. No longer content to live in their cities, urban workers are making their homes in rural Puslinch; but they are difficult to control; they spread their habitations along paved roads, shunning a community atmosphere. Puslinch is slowly but definitely being taken by the cities, whose people are converting it to their own uses.

FOOTNOTES to BOOK III

- 1 See town plot maps in Township offices at Aberfoyle.
- 2 Twelve Mile Creek Conservation Report, Conservation Branch, Dept. of Commerce and Development (now Lands and Forests), Toronto, 1960, Water Section, p. 19-22.
- 3 Annals of Puslinch, p. 34; see also old map on file for Puslinch at Dept. of Lands and Forests, Maps and Surveys Office, East Block, Queen's Park, Toronto.
- 4 Twelve Mile Creek Conservation Report, Water Section, p. 26-7.
- 5 Spencer Creek Conservation Report, Conservation Branch Dept. of Commerce and Development (now Lands and Forests), Toronto, 1960, Recreation Section, p. 18-9.
- 6 Meaning over a wide area, not necessarily a large volume of business.
- 7 Interview with manager, January, 1963.
- 8 Due to date of flight, early June.
- 9 "Woodland Reports", Grand Valley Conservation Authority, Galt; The Twelve-Mile Creek Conservation Authority, Milton; The Spencer Creek Conservation Authority, Milton. See a description in Twelve Mile Creek Conservation Report, Forestry Section, Chapt. 2.
- 10 For a recent hog-producer's plebiscite Puslinch counted 194 hog-producers.
- 11 For a farmer with a small cattle herd, swine give an outlet for the surplus cream. Swine and cattle are thus natural partners.
- 12 But the increasing trend to purchase grains from mills is upsetting farmer land use patterns.
- 13 It is admitted that the rural villages may attract a relatively large share of the older district people, thus modifying this argument.

- 14 Puslinch woodlots in the Twelve-Mile & Spencer Creek watershed show more grazing than av'g. for those watersheds. In Speed watershed, Puslinch is lower, but this is probably due to the Speed and Eramosa spillways, which are little used for pasture; see the respective Conservation Reports, Forestry Section.
- 15 The Twelve-Mile Creek and Spencer Creek Authorities, at least, offer to plant trees free of charge, if the owner purchases them from Dept. of Lands and Forests for only one cent each.
- 16 Hobby farming may also be a tax-dodge -- a way of eliminating surplus profits to ^{gain} lower taxation.
- 17 The operating area of these co-ops would be set up in light of developments under heading "3" below. They would include "left-over" forest, but could well be operated in conjunction with the forest tracts of Recommendation 3.
- 18 A typical area to be set up under this scheme could be Con. XI Lots 26-37.
- 19 A typical area to be set up under this scheme could be Con. X Lots 11-15.

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