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NIAGARA TOWNSHIP

A STUDY IN LAND UTILIZATION

By

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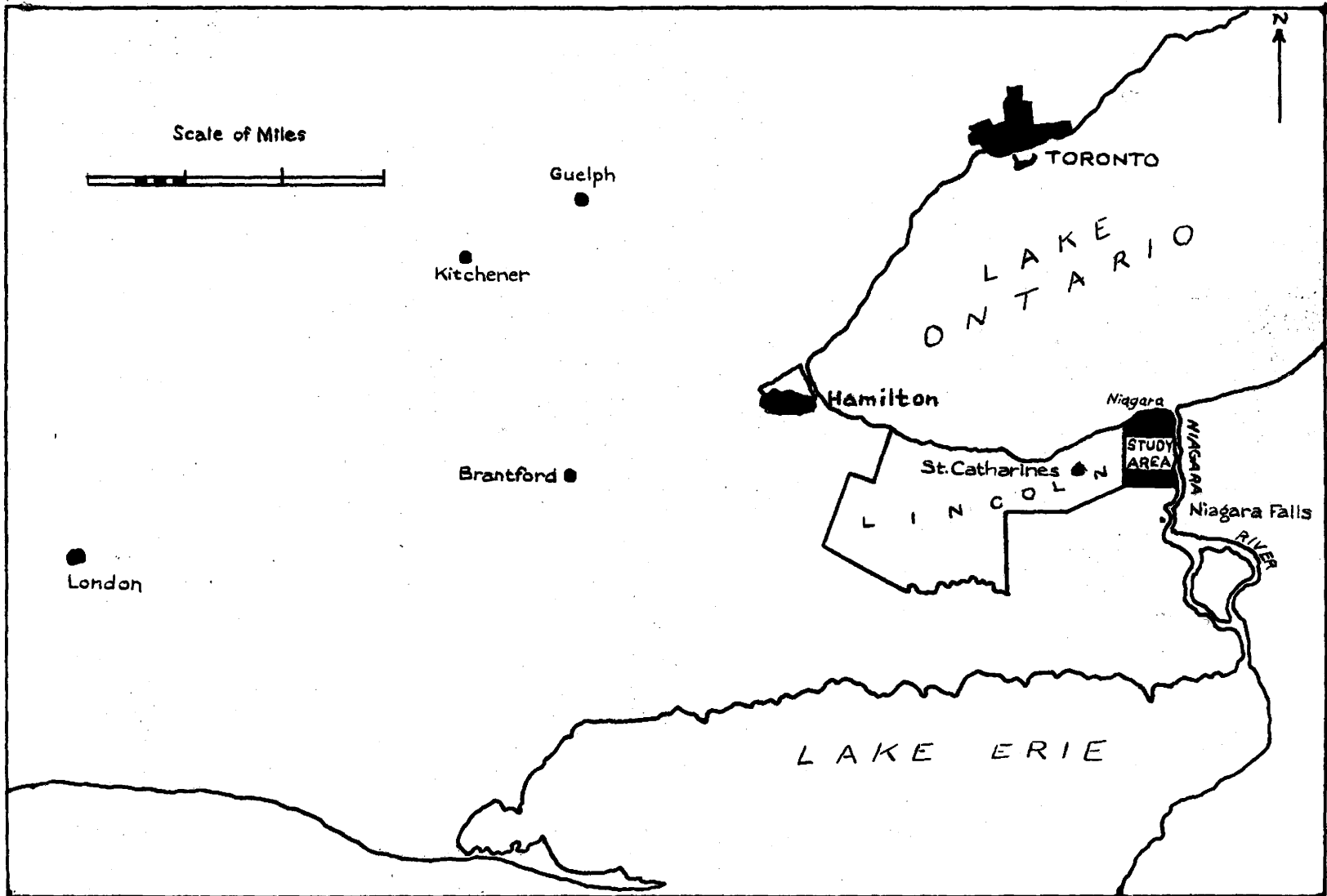
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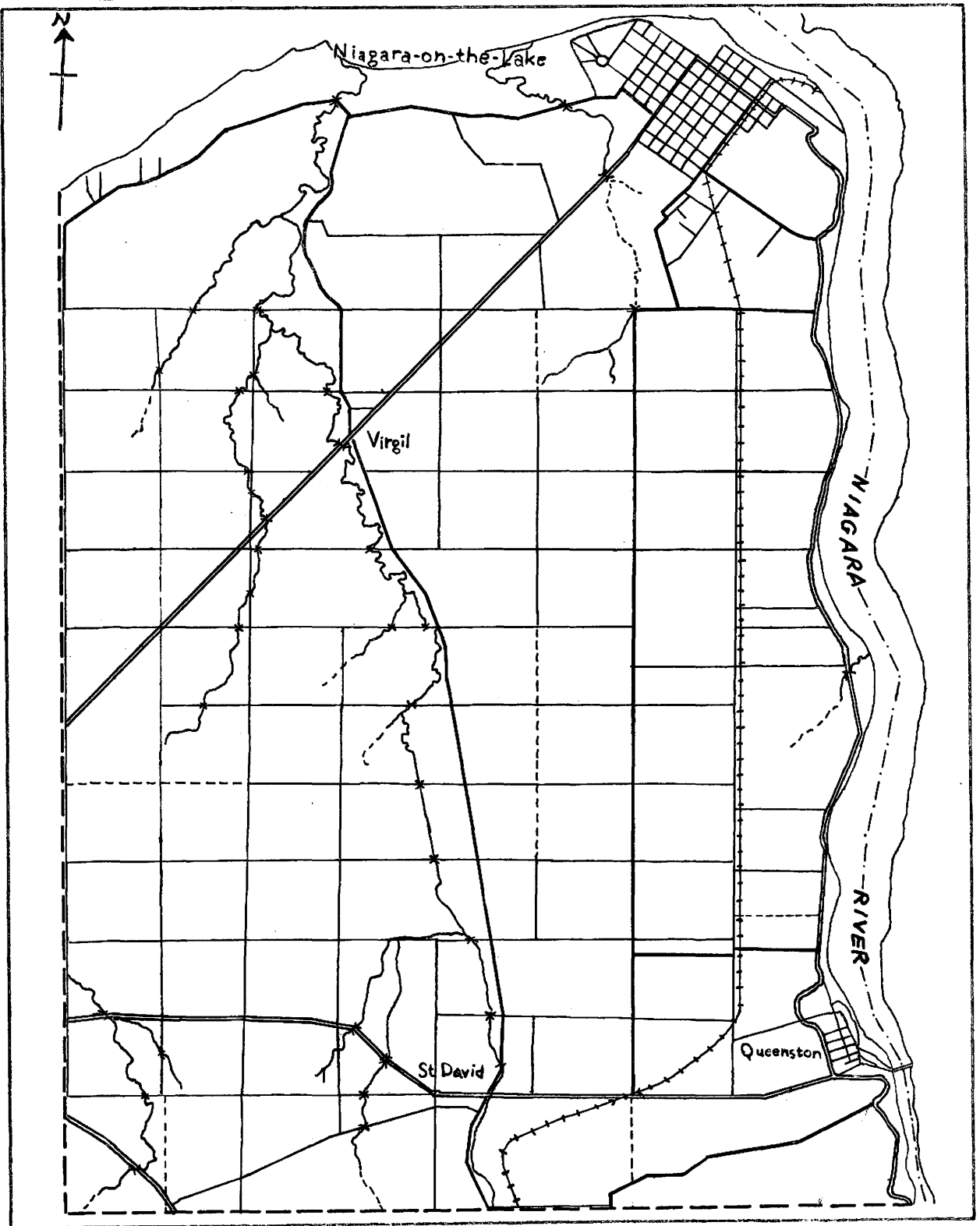
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INTRODUCTION

The following work is a study of the mode and pattern of land utilization in Niagara Township in 1955, and an attempt to give reasons why this use is being made of the land. This is an attempt at correlation between man's work and the diverse factors of the physical environment, and a study of how man has accepted or altered this environment to suit his needs. This has involved not only a study of present day conditions, but also of the historical development of both human and physical geography through which the present was evolved.



LOCATION MAP



NIAGARA TOWNSHIP

Scale 1:63360

KEY MAP

LEGEND

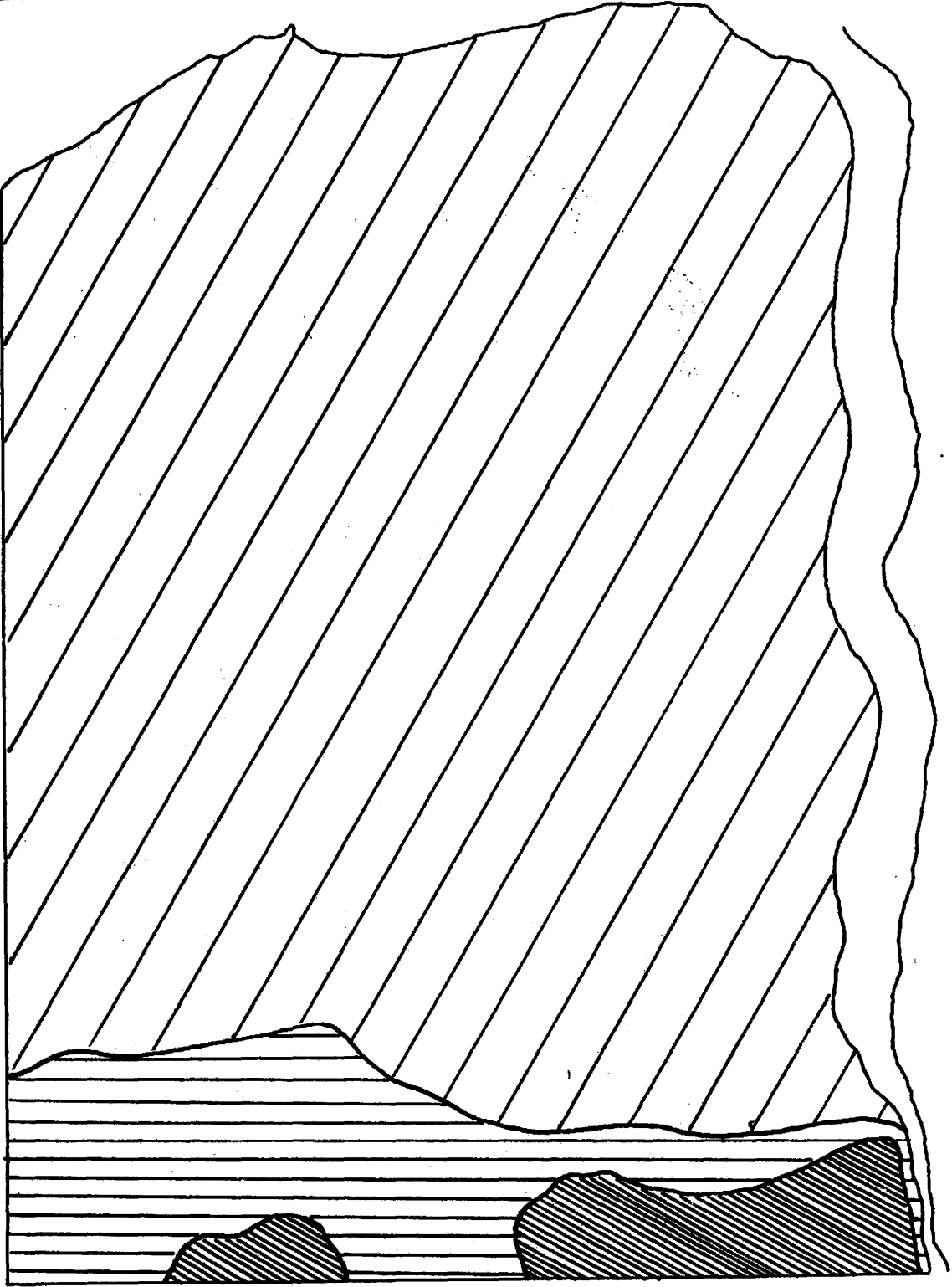
- | | | | |
|----------------|-------|------------------------|-----------|
| PRIMARY ROAD | == | RAILROAD | ++ |
| SECONDARY ROAD | — | STREAM | ~ |
| OTHER ROADS | — | TOWNSHIP BOUNDARY | - - - |
| UNUSED ROAD | - - - | INTERNATIONAL BOUNDARY | - · - · - |

LOCATION

The township is located in the ^{north}southeast extremity of Lincoln County along the border between Canada and United States. For the most part, it is in the Niagara Peninsula Fruit belt, a small section being above the escarpment which runs east-west through the southern edge of the township.

Niagara Township is bounded on the west by Grantham Township, on the ^{south}north by Stamford Township, on the east by the Niagara River and on the north by Lake Ontario. It is located between $79^{\circ} 10'$ W. longitude and $79^{\circ} 3'$ W. longitude, and also between $43^{\circ} 9'$ N. latitude and $43^{\circ} 16'$ N. latitude.




The boundaries bear generally in north-south and east-west directions and include approximately thirty-eight square miles or 24,500 acres of land. It is roughly rectangular in shape extending seven to eight miles from north to south and five to six miles from east to west. It includes four main highways and one, almost unused rail line, and has a border-crossing bridge at Queenston.



NIAGARA TOWNSHIP BEDROCK GEOLOGY

SCALE 1:63360

LEGEND

-  QUEENSTON SHALE (RED, PARTS SANDY)
-  ROCHESTER SHALE, CLINTON LMST. & MEDINA SANDSTONE (GREY)
-  LOCKPORT DOLOMITE (GREY)

(AFTER CANADIAN GEOL. SURVEYS)

Chapter 1

PHYSICAL GEOGRAPHY

GEOLOGY

The early geological history of the Niagara region, it may be assumed, commences with a vast Pre-Cambrian peneplain. In the Paleozoic Era, until the end of Cambrian times, this area remained above sea level. During Ordovician times, however, the seas came in to cover the area and lime muds and clays were laid down, accounting for such present day deposits as Queenston shale.

At the end of this period the seas retreated and the area was subjected to erosion. The seas advanced once more, however, in Silurian times, and massive lime deposits were laid down. These produced, among other deposits, what is today known as Lockport dolomite, a much more resistant rock than ordinary limestone, due to its magnesium content.

After another retreat, the seas reappeared in Devonian times. Alternating advancements and retreats of the seas caused more deposition. Evidences of these fluctuations which occurred in every period, are the types of deposits found. Lime muds and clays are deep water deposits whereas sands which produce sandstone are shallow water deposits. All evidences of Devonian deposition have since been eroded off in the Niagara region leaving Lockport dolomite as the uppermost of marine deposits.

When the Devonian Period closed the seas again retreated and never penetrated this area again. Now the agents of erosion were able to proceed in carving out surface configurations.

Somewhere between the end of Devonian times and the present, however, there was a slight tilting of the area towards the

Mississippi basin in a south-westerly direction, thus exposing the soft shales underlying the more resistant layer of dolomite. These soft shales were attacked by weather and running water and were more easily eroded. As this process continued the more resistant dolomite was left protruding until broken off under the force of gravity.

The result of this action is the Niagara Escarpment which, in Canada, extends from the Niagara River near Queenston to the tip of the Bruce Penninsula. Vertical cliffs along its brow mark the edge of dolomitic formations beneath which are slopes of red and grey shale, limestone and sandstone. This escarpment provides a break of about 275 feet between two levels of the Niagara Penninsula.

GLACIOLOGY

After the formation of the escarpment came the series of continental glaciers which moulded the present day landforms of the region. The entire peninsula was subjected to glaciation and, although visible evidence of greater than one ice advance is fragmentary, a great number of landforms were left by the last (Wisconsin) glacier.

The ice sheets advanced southwest through the present day Lake Ontario basin which, before glacial times, was a river valley. This ice gouged out and transported large amounts of debris. Some was unevenly deposited on the scarp face as ice moved up to the dip slope. Till extends from the base of the escarpment to the present Lake Ontario shoreline and continues out under the lake.

As the last glacier receded, Lake Iroquois, the forerunner of Lake Ontario, was formed due to the trapping of meltwaters

between the ice front and the base of the escarpment. There were no outlets for this accumulating water until the ice front receded beyond the opening into the Hudson Mohawk gap. This gap which was a preglacial valley allowed for the escape of water through it to the Atlantic Ocean. It provided the lowest pass thru the eastern mountain range.

Lake Iroquois continued to drain through this outlet for many thousands of years and was fed not only by waters from the melting ice lobe, but later by water coming through the Niagara River from glacial Lake Algonquin. As the climate became warmer and the Labrador glacier continued to retreat, the St. Lawrence valley, which provided the original outlet to the ocean for this section of the continent, was opened up. In the course of time, after a series of fluctuations, Lake Ontario reached its present level.

Before Lake Iroquois appeared however, the lowland of which most of Niagara Township is comprised, must have been largely morainic and undulating with ridges of till and undrained hollows. But, through deposition and wave action, the hills were cut down and the depressions filled in most effectively, leaving a flat plain with a gentle slope inwards, sufficient for appropriate drainage.

Wave action along the Iroquois shoreline also undercut till slopes producing a shore cliff about thirty five feet high. Gravel and sand were deposited along the base of this shore cliff thus building up a well marked beach which now appears as a terrace formation sloping gradually down to the north.

This old shoreline begins at the base of the escarpment at Queenston but, within a mile or two to the west, extends

away from it to the north. The terrace continues westward past St. David's valley, below gently undulating hills of drift. The 375 foot contour is slightly above the level of the beach, and Highway Number 8 between Queenston and St. Catherines runs just to the south of it.

No deposits of the lake have been observed at Queenston but a gravel pit five and one-half miles north near Fort George shows twelve feet of beach gravel. This indicates wave work at a lower level (300 feet) than indicated by a gravel deposit at Lewiston (375 feet). It was probably formed at an earlier stage of Lake Iroquois.

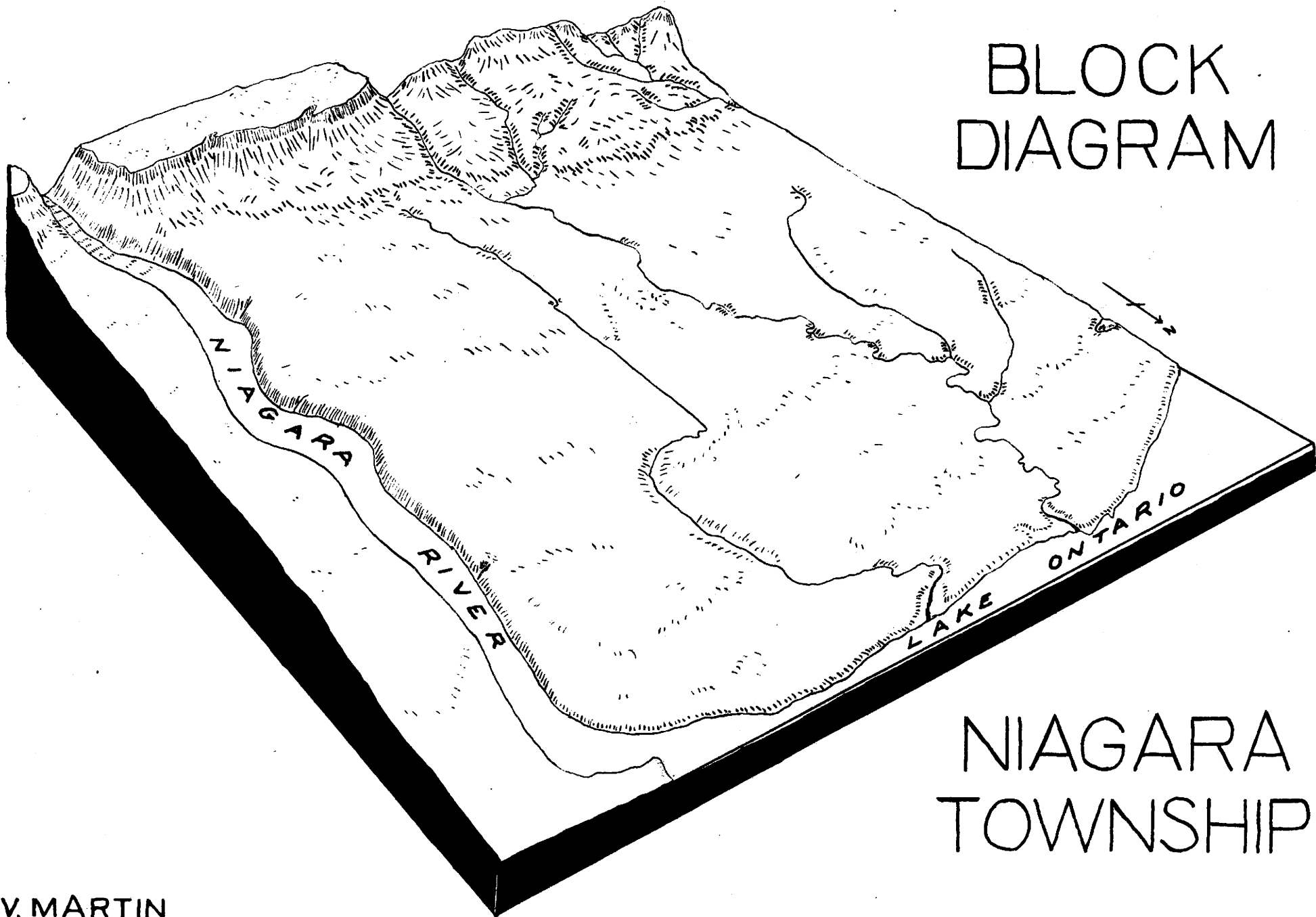
POST GLACIAL GEOLOGY

Post glacial geology in the township has consisted mostly of the erosion and weathering of the previously deposited materials. Stream erosion has been of a minor degree here. Four Mile Creek, the only stream of any great length in the township, drains from the escarpment north through St. David's valley and down across the Iroquois plain to Lake Ontario. It is not very large, and has little gradient once it reaches the plain. Other small creeks have been extended by man-made channels to provide drainage, but are often intermittant and do little erosional damage.

The only serious erosion in the area is that done by the wave action of Lake Ontario, an estimated three feet back-cutting per year. Not only is the expense in combatting this erosion heavy, but there is also a loss of valuable soil.

The Canadian bank of the Niagara River provides a good cross-sectional view of the present day geology of the town-

BLOCK DIAGRAM



NIAGARA TOWNSHIP



Fig. 1. The Niagara Escarpment, with No. 8 Highway to the right, as seen looking west from Brock's Monument.



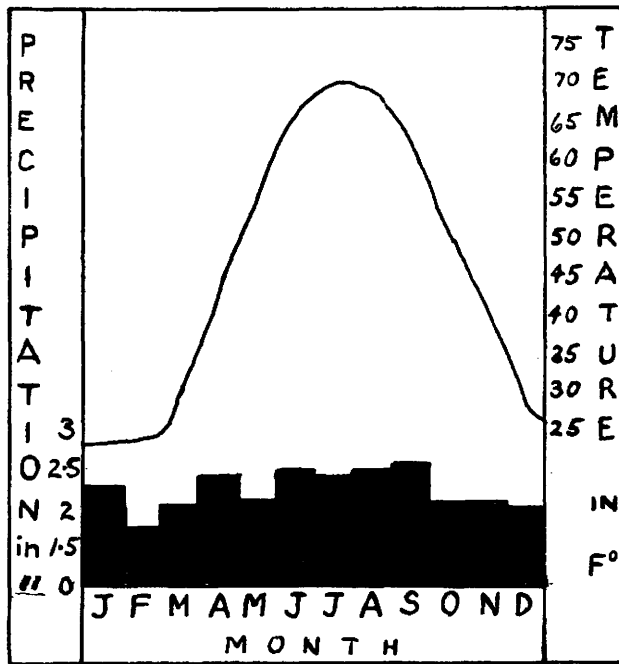
Fig. 2. The level Iroquois lake plain as seen from Brock's Monument on Queenston Heights.

ship. Below Queenston the bank, for about three miles, consists of red (Queenston) shale with a thin covering of drift above it. The shale then disappears and gives way to a low cliff of grey till.

At the mouth of the river, near Fort Mississauga, this till is no longer exposed. The twenty foot cliff shows only gravel covered in places by as much as six feet of varved clay. The foot of the cliff, however, is concealed by talus which may conceal boulder clay, since the shore is strewn with boulders. The gravel may be of early Iroquois age or of the much later age of Lake Frontenac, an intermediary lake between Iroquois and Ontario.

From Niagara-on-the-Lake west, the shore cliff ranges from twelve to twenty feet in height and consists mainly of till sometimes covered by varved clay. There are evidences of two sheets of till, the older one being largely formed of ground[?] up Queenston shale.

The township of Niagara could therefore be divided up into four sections on a general physiographic basis. These are :1) the Iroquois lake plain which extends from the lake south to the old Iroquois shoreline; 2) the undulating gravel terrace which extends on from here to the base of the escarpment; 3) the Niagara Escarpment which extends east and west across the southern portion of the township and is broken only by the pre-glacial St. David's valley; and 4) the till plain which extends south from the brow of the escarpment in the southeast corner of the township.



CLIMATIC CHART
 OF
 NIAGARA TOWNSHIP

P. V. MARTIN

CLIMATE

Niagara Township lies for the most part in the climatic region which Putnam and Chapman classify as the Niagara Fruit belt, a region stretching from Hamilton east to the Niagara River and from the base of the escarpment north to Lake Ontario. A small part of the township, which lies above the escarpment, however, lies in the region known climatically as the Lake Erie Counties, but most of this is taken up by the Ontario hydro developments and the Queenston Quarries. It is therefore of minor significance to this study except as a contrast to the fruit belt.

These differences can be clearly seen in the table below taken from "The Climate of Southern Ontario" by Putnam and Chapman. The accompanying climatic chart also reveals the climatic conditions of the lake plain.

| | <u>Below Escarpment</u> | <u>Above Escarpment</u> |
|---|-------------------------|-------------------------|
| Altitude | 350 feet | 600 feet |
| Mean annual temperature | 47° F | 46° F |
| Mean winter temperature | 25 | 23 |
| Mean Spring temperature | 43 | 43 |
| Mean Summer Temperature | 68 | 67 |
| Mean Fall temperature | 51 | 49 |
| Extreme low temperature | -16 | -34 |
| Extreme high temperature | 104 | 106 |
| Daily temperature range | 17F° | 18F° |
| Average date of last frost in Spring | May 8 | May 10 |
| Average date of first frost in Fall | Oct. 13 | Oct. 10 |

Below EscarpmentAbove Escarpment

| | | |
|---|-----------|-----------|
| Average length of frost-free days | 158 | 153 |
| Beginning of growing season | April 11 | April 14 |
| End of growing season | Nov. 9 | Nov. 3 |
| Average length of growing season | 272 days | 203 days |
| Average annual precipitation | 30.9" | 33.8" |
| Average annual snowfall | 38 " | 61 " |
| Average rainfall April 1 to Sept. 1 | 15.7 " | 17.1 " |
| Average Summer rainfall (J.J.A.) | 8.0 " | 8.8 " |
| P-E index (potential evapotranspiration) for June, July and August | 11.5 | 12.5 |
| Frequency of droughts (less than one inch per Summer month over a 50 year period) | 30 months | 20 months |
| Percent of possible sunshine in growing season | 55% | 54% |

Climatic conditions provide this region with a cool, temperate, semi-humid type of climate with occasional subtropical heat waves in the summer. The main factors affecting this area are latitude, the proximity of the lake, local relief, and the nearness of the area to the paths of cyclonic storms.

Latitude has only a general effect on the climate. The township is situated at 43° north latitude about midway between the north pole and the equator. This places it in a region of only moderate seasonal variation (46F°) and also puts it in the path of prevailing westerlies.

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The factor which is most important in creating this particular climate, however, is the position of the township in relation to Lake Ontario. The lake helps to ameliorate extremes of climate caused by the continental position of the area. It also initiates local low pressure systems and thus helps the more important equatorial lows to break in. This effect produces warm weather earlier in Spring and helps delay cold Fall weather, a very important factor in the growth of tender tree fruits.

The effectiveness of the lake as a moderating influence, however, decreases somewhat going towards the escarpment. Also, the lake proves more effective in Spring, Fall and Winter.

The Niagara Escarpment is also a factor of control in the climate of the township. It tends to shield the area somewhat from some of the heavier storms. The temperature gradient from the lake plain to the escarpment brow varies little in summer but steepens in fall and winter. This is when the escarpment is most important. Along with the lake's influence, the escarpment protects the plain below from extreme low temperatures and from heavy snowfalls.

Being close to the path of cyclonic storms, this region receives some variations from the prevailing winds, and thus occasional storms and heat waves occur. The early Spring, the prevalence of north winds in April, and the high humidity of the air during hot summer months combine to produce one of the wettest areas in Ontario in Spring and Summer, despite low total precipitation. It is also the second warmest region in Ontario.

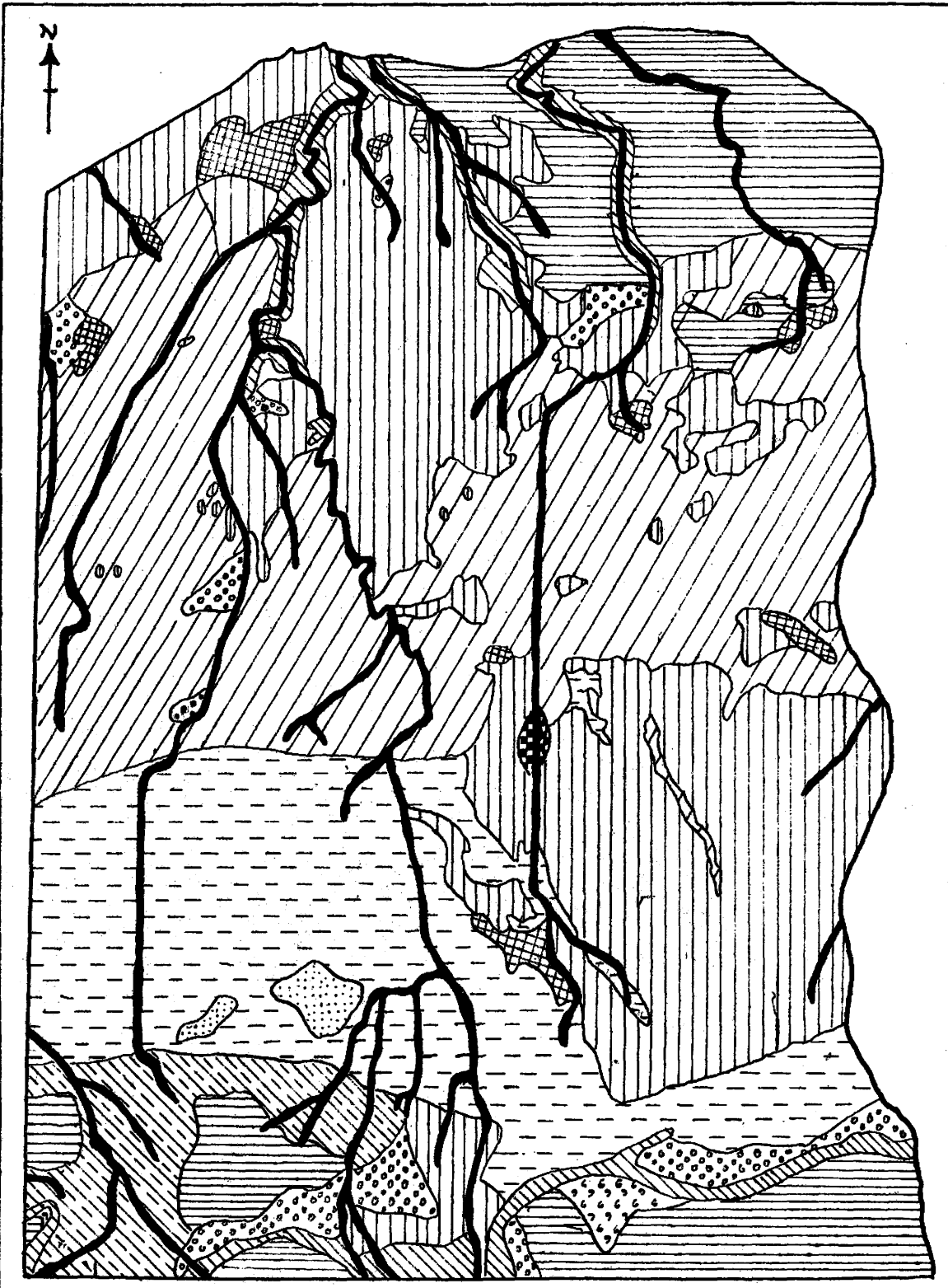
NATURAL VEGETATION

Niagara Township is located in the Niagara section of the deciduous forest region. This contains broad leaved trees including beech, sugar and red maple, basswood, and red, white and bur oak. Other deciduous species of lesser development occur singly or in small stands. Included here are chestnut, pignut and shagbark hickory, scarlet, black and pin oak, and black walnut.

Poorly developed coniferous species can also be found scattered throughout the township. These include hemlock, white pine and juniper. All species, coniferous and deciduous, are found below and above the escarpment. The climatic difference is not enough to affect tree growth.

Of this original forest cover, however, only small farm woodlots remain, as most of the arable land has been cleared. Trees are now found mostly in poorly drained or in those areas having shallow soil cover. Examples of the latter are the steep escarpment slopes which produce a long sinuous permanent forest belt. Some farmers, however, have kept stands on potentially good cropland because of their commercial value or their domestic value as fuel.

When settlers first pioneered this township in the late eighteenth century nearly all of the land was under forest cover. By 1851 8,532 acres out of 21,281 held by farmers remained in woodlot. Today this has been reduced to 668 acres of the 19,808 acres held.



NIAGARA TOWNSHIP SOILS

SCALE 1:63360

LEGEND

- | | |
|----------------------------------|--------------------------|
| ■ BOTTOM LAND | ▨ HALDIMAND CLAY |
| ▤ VINELAND SANDY LOAM | ▧ CAISTOR CLAY |
| ▩ WINONA SANDY LOAM | ▦ LINCOLN CLAY |
| ▧ TRAFALGAR CLAY | ▥ CAMPDEN CLAY |
| ▦ VIRGIL CLAY LOAM | ▤ FLAMBORO CLAY LOAM |
| ▥ CHINQUACOUSY CLAY LOAM (STEEP) | ▤ CHINQUACOUSY CLAY LOAM |

(AFTER O.A.C. SOILS SURVEY)

SOILS

This account is based on the unpublished report made by the Soils Department of Ontario Agricultural College. This report differentiates the soils according to parent materials and drainage.

Most of these soils belong to the Grey-brown Podzolic Great Soil Group. There have been some alterations, however, due to local conditions, especially drainage. This has produced soils which are considered as part of the Intrazonal Dark Grey Gleisolic Group.

The following is a list of the major soil types in Niagara Township accompanied by a brief description of each, and located more exactly on the accompanying soil map.

A - Soils developed from outwash materials

Vineland Sandy Loam - imperfectly drained.

This comprises a major part of the outwash soils of the area. It is found in areas of very gentle relief. The organic matter content is medium. In some regions a thin layer of clay one or two inches thick occurs at a depth of two to three feet. Beneath this layer, sand continues. Mottling occurs throughout the profile.

B - Soil developed from outwash materials over heavy clay and till.

Winona Sandy Loam - imperfect drainage.

This soil type is found chiefly in areas where there was from one to three feet of sandy material deposited over clay or heavy clayey till. This clay restricts internal drainage and keeps water from running off. The use of tile drainage, however, has overcome this handicap in many places.

C - Soils developed on fine textured reddish shaley till

Trafalgar Clay - imperfect drainage

Shaley till derived from the underlying shale bedrock provides the parent material for this soil. Relief is fairly level and internal drainage is very slow. The organic matter content is low and the resultant soil structure is extremely poor. Some mottling occurs in the profile which is relatively free of stones.

D - Soils developed on fine-textured limestone - shale till

The till from which these soils are developed is very heavy and stoney, and has a characteristic grey to greyish-brown colour. It also contains considerable reddish-brown shale fragments. These soils are poorly to imperfectly drained.

(1) Chinquacousy Clay Loam - imperfect drainage.

This type is found on lower slopes. The upper part is distinctly mottled and the profile is shallower than others of this catena. This is classified as a member of the Grey Brown Podzolic group.

(2) Chinquacousy Clay Loam - Steep phase

This has a much greater circulation in the township, being found on the upper slopes along parts of creek valleys and along the escarpment.

(3) Virgil Clay Loam - moderately poor to poor drainage

This clay loam is a member of the Dark Grey Gleizolic Intrazonal group. Its poorly drained condition is caused by the heavy nature of the soil and also by the nearly level terrain on which it is found. The low amount of organic matter and the intensive cultivation have produced an extremely poor physical structure here. The surface soil dries out rapidly and is

exceedingly difficult to work.

E - Soils developed on lacustrine materials

Lacustrine materials were deposited over the underlying till moraine in various thicknesses. A few boulders are scattered over the surface but very few stones occur in the profile. These soils, very low in organic matter, are characteristically light grey when cultivated and dry. The surface texture ranges from a clay loam to a heavy clay, and drainage ranges from moderate to very poor. These soils are very hard when dry and have very poor physical structure. They are extremely acid in reaction.

(1) Haldimand Clay - moderate drainage.

This soil type is found mainly on the slopes of the gravel terrace over clay sediments. Here the terrain is gently sloping and external drainage is medium. Internal drainage, however, is slow. The organic content is low and carbonates occur at twenty to twenty-four inches. It is free of stone or grit within the profile and few boulders appear on the surface.

(2) Caistor Clay - imperfectly drained

The clay plain above the escarpment in this township is composed mostly of this soil type. It is also found on level areas below the escarpment on the gravel terrace and on the lake plain near Niagara-on-the-Lake. The topography is very gently sloping to level. Like the previous clay it is a member of the Grey-Brown Podzolic group and is strongly acid.

(3) Lincoln Clay - poor drainage.

This soil type is located on the lake plain in the southern part where topography is level. Due to imperfect surface drainage and poor internal drainage it is a member of the Dark-Grey

Gleisolic group.

(4) Campden Clay - very poor drainage.

This is also an intrazonal soil of the Dark Grey Gleisolic group. It is located in depressional areas, of which there is one in the township on a stream course. Very poor external and internal drainage are both due to high clay content. When dry the clay breaks into hard clods, and cultivation is difficult unless ideal moisture conditions prevail. This has a more alkaline reaction than the well-drained members of this catena.

F - Shallow soils over limestone bedrock

Flamboro Clay Loam - variable drainage

There is little or no profile in this type and sometimes bedrock occurs at the surface. It is located near the brow of the escarpment.

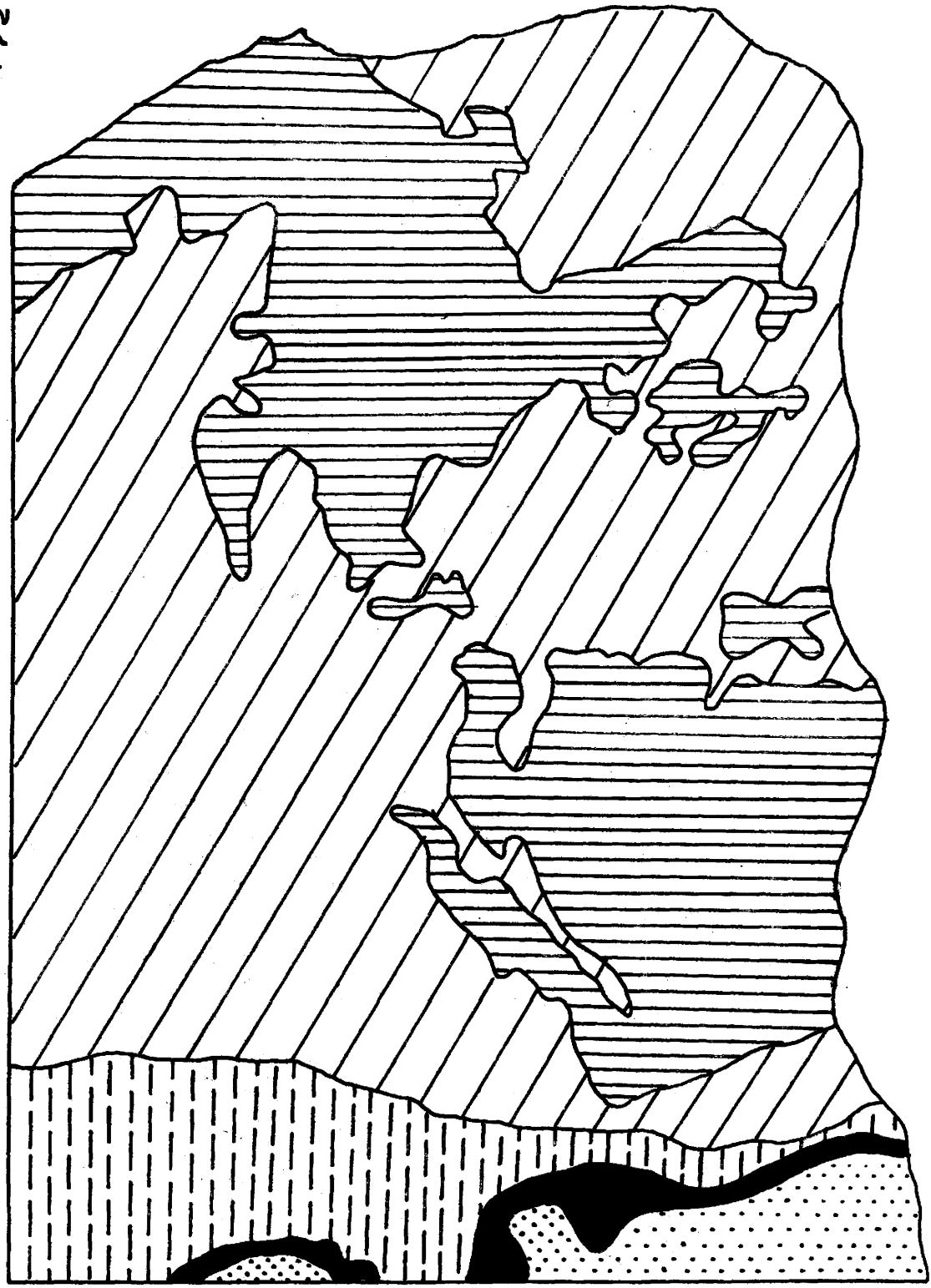
G - Miscellaneous Soils

(1) Bottomland

This is found along all stream courses and drainage ditches. Soil forming processes are unable to operate and there is therefore no profile development.

(2) Escarpment

Steep slopes and lack of soil cover prevents profile development on part of the escarpment.



NIAGARA TOWNSHIP LAND TYPES

Scale 1:63360

- | | | | |
|----------------------|--|------------|--|
| TILL PLAIN | | CLAY PLAIN | |
| ESCARPMENT | | SAND PLAIN | |
| DISSECTED TILL PLAIN | | | |

P.V. MARTIN

LAND TYPES

This is a division of the township into areas, each of which has one or more distinctive physical features to distinguish it from adjacent areas. These divisions were made by using soil types, parent material and drainage, and can be located on the accompanying map.

1. Clay Plain

This type consists of parent materials deposited in glacial Lake Warren, a forerunner of Lake Erie. For this reason it occupies that part of the township lying above the Niagara escarpment. The soils are flat lying clays with imperfect to poor internal and external drainage. This limits their use a great deal, often confining them to scrub or grass.

2. The Niagara Escarpment

The face of the escarpment is, in spots, obscured under mantles of debris deposited by advancing glaciers. This has allowed for the development of the steep phase of Chinquacousy clay loam soils. Some sections, however show an exposed scarp face or are very thinly covered with till. Flamboro clay loam, which has little profile development, has developed in such areas. Drainage on the escarpment is poor internally, but often excessive externally, producing deep gullying due to rapid runoff.

3. Dissected Till Plain

This section extends from the base of the escarpment to the Iroquois lake plain. It consists of till which was deposited by the advancing glaciers but left untouched by the wave action which levelled out the plain to the north of it. It has a rolling



Fig. 3. The undulating dissected till plain, planted in grapes and pasture.



Fig. 4. Looking north from the dissected till plain down onto the lake plain. Notice how the gentle shore cliff has been left under grass to prevent erosion.

surface configuration, intensified around St. David's valley by the stream erosion of Four Mile Creek. Clay loams and clays are the predominant soils. Drainage is imperfect but better than that of the lake plain.

4. Iroquois Till Plain

This takes in that part of the township north of Highway No. 8, excluding those sections overlain by sand. The soil parent material consists of limestone-shale till deposited by the Wisconsin glacier then levelled out by the wave action of Lake Iroquois. Lacustrine deposits also comprise much of the parent material, especially in the southern part under Lincoln Clay. It is therefore a flat lying area with poor external and internal drainage. It has a gentle southward slope of about ten to thirty feet per mile.

Sand Plains

This land type is also found on the Iroquois Lake Plain in spots where outwash deposits of sand were laid down, over till, by the retreating glacier. This produced areas of sandy loams with moderate to imperfect drainage, better than that on the till plain.

Chapter 2

HISTORY OF SETTLEMENT AND AGRICULTURAL DEVELOPMENT

1776 - 1814

The Pioneer Period

Before this period the only inhabitants of the township were Indians. They picked this location which today is the commons in Niagara, for three reasons, the favourable climate, the ease of transportation by lake and river, and its defensive position. They paved the way for the first white settlers by the establishment of some farming, and more important, the blazing of routeways to the interior.

La Salle inspected the area in the late seventeenth century but established Fort Niagara on the east bank of Niagara River because of the more favourable portage over the falls on that side. It wasn't until the late eighteenth century that the west bank was settled by white men.

The first concentrated white settlement in the township was induced in 1776 by the outbreak of the American War of Independence. During it, thousands of refugee United Empire Loyalists thronged to Fort Niagara, a British outpost, after having been driven from their homes in the thirteen colonies. To relieve this concentration of people and the accompanying food problems, plans were made by General Haldimand, Governor-in-Chief of Canada, to divide the land west of the river into lots and distribute it to refugees capable of cultivating the soils.

During the summer of 1780 the clearing and breaking up of land began so that winter wheat, to which the climate and soils were found conducive, could be sown. At this time four or five families had settled and were building houses. By the summer of

1781, sixteen families (sixty-eight persons) had settled bringing with them forty-nine horses, forty-two head of cattle, thirty sheep and 103 hogs. These first settlers picked the well-drained sandy loam sections of the lake plain for farmsteads.

Among the first settlers after the area had been surveyed and lots laid out, was Captain Daniel Servos of Butler's Rangers. He built a house, then a grist and saw mill on the four mile creek at the lakeshore road. Peter and John Secord built the first grist mill in 1782 at the present site of the village of St. David's where the swift waters of the creek provided power. The land was granted in amounts which conformed to positions held in the army or to the size of civilian families.

In 1783, following a peace treaty which gave all land east of the river to United States, fully 10,000 people entered the peninsula at Niagara and Queenston. The favorable climate, especially the mild winters, and the well drained soils of the lake plain, plus the lack of good roads into the interior, induced many to settle in the peninsula and especially Niagara Township.

At the end of 1783 an official report showed that forty-six families had settled in this vicinity. They had cleared 713 acres of land. 123 acres were sown with winter wheat and 342 acres were ploughed ready for spring sowing. Within a few years most of the land in the township was occupied.

With these rural settlers came many British occupants of Fort Niagara, especially the merchants and tradesmen. They quickly took up their places in the newly forming town of Niagara. It was made the centre of local government and was the mother town from which began the first extensive settlement of

Upper Canada. Fort Niagara in a short time became United States property, and all British interests were transferred to the town of Niagara where Fort George was built.

From Niagara, Indian trails provided routes to the interior. As early as 1785 loyalists blazed a road from Niagara as far inland as Ancaster. By 1800 another road was opened following the lake shore from Niagara to Burlington, and still another stretched west from Queenston along the dissected till plain near the base of the escarpment. Other roads were developed rapidly, following old Indian trails, connecting the lakeshore with St. David's and Niagara with Queenston. These old Indian trails followed the most accessible routes, avoiding the dense forests of the lake plain as much as possible. By 1812 good summer clay roads and winter roads of snow allowed Niagara and Queenston to serve the interior of Upper Canada.

This was the pioneer stage of development, an era of homesteading. For the first thirty years the chief concern was the clearing of land, the increasing of field crops, and the improvement of homes and furniture. While clearing their land, homesteaders relied on government stores at Niagara for their grain and flour but by 1786, through community efforts, they had become fairly independent subsistence farmers. The growing of wheat, corn, oats, barley and other grains and root crops appeared followed soon by the planting of apple, plum, pear and cherry trees and small vegetable gardens.

With 1787, however, came the "Hungry Year", one of drought and burning heat. Crops failed, cattle starved, game disappeared and forest fires broke out. The government was called upon once again to supply food. The proximity of Lake Ontario, which supplied both food and water, did much to prevent the extermination

of settlement, and with good weather the next year, agricultural progress continued.

Population increased throughout this period as did the amount of cleared land and the abundance of crops. This was greatly aided by the rapidly rising town of Niagara which became the capital of Upper Canada after its formation in 1791. Niagara had become a military centre as well as one of business and commerce. It contained branch offices and stores for the large mercantile firms of Quebec and Montreal and was the wholesale and retail outlet for the whole province.

The large civilian and military population provided a ready market for any surplus farm products of the surrounding district. The soldiers stationed here also provided, as well as protection for the district, abundant labour for the building and improvement of roads. They were encouraged by Governor Simcoe who, while residing here in 1793, also encouraged agriculture and led the forming of the first agricultural association in Canada.

Although the site of the capital was moved to Toronto for defense purposes, and some of the military population with it, trade was not diverted to any extent until the building of the Welland Canal. Improved roads to the interior, the portage at Queenston and a new steamer service to Kingston in the early nineteenth century, allowed Niagara to retain her lead and continue growing. By 1812 it had over 300 houses and buildings and its population was about 1500 not including 600 to 1000 military personnel.

Farms in the township improved with the growth of the town. Many of the farmers knew all about profitable cultivation of the land from experience gained in the old country, and with

3

its application the area began to take on a new face. "In short, twenty-five years had sufficed to turn the wilderness of woods into a rural paradise where all things goodly grew for the use of man!"¹

Agricultural production continued to advance until 1812 when war broke out between Britain and United States. This gave the agricultural growth of the township a severe check for about three years. Being right on the frontier, it was the scene of many battles, and destruction reigned high both to property and to human life.

The town of Niagara was destroyed by retreating American troops who burnt it right to the ground and scattered its population. St. Davids, which by this time was a thriving farm centre, was also burnt to the ground. Neither place regained its prewar prosperity. The money spent on reconstruction left little capital to carry on business.

1815 - 1850 The Mixed Farming Period

In 1815 farmers were ready to specialize, raise cattle and swine, and produce grain for export. Although renovation of war damages produced a slow start, farmers began to prosper again through a series of large crops and good market prices.

The large crops were due to the clearing of more land aided by the increasing rural population which, by 1822 had reached 1207. An increasing knowledge of the soil and climatic requirements for crops, combined with the previous factors to produce greater and more varied crops.

1. (W. Kirby - Annals of Niagara Ch. 22 p 175)

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The good prices were due to better trade relations with England. The Napoleonic Wars and the resultant war with United States had forced England to rely more on Canada for needed naval stores and food supplies. Canada received a preferential tariff which brought a boom to cash crops in the township.

As yet, specialized cultivation of fruit for export had not appeared. Fruit orchards, excepting peaches were planted on most farms before the turn of the century, but in many cases were neglected or left for the swine and cattle. Grape vines still only grew wild. Peaches were introduced from France by James Durham on his river road farm but were not developed commercially until the latter part of the century. Grain and root crops comprised the bulk of the cleared land and the farm profits along with cattle and swine.

As the rural population prospered, so the town of Niagara prospered, although in 1822 its population was only 1086 as compared to 1500 before the war. After it, Niagara received much of the military population, some of whom were men of wealth. The Niagara Dock Company was formed for building vessels and steamers plus machinery, docks and wharves. A large foundries and a shipyard were erected. These, plus the many stores, gave employment to a large number of businessmen and artisans and the town was prospering both as a retail and wholesale centre for Upper Canada and as a port and manufacturing centre.

In 1824, however, the idea of a canal linking Lake Ontario and Lake Erie evolved. New commercialism had begun the transportation of commodities in bulk, and portages had to be replaced by canals. Efforts were made to have it built near Niagara but, with no logical site, they failed. The canal's

present location was given preference due to the shorter distance between the lakes and the better construction facilities. By 1830 it was in operation.

The canal not only drew business away from Niagara and the Queenston portage, but also provided water supplies and power for new industries. It caused a shifting of interests such as boat building, and also a shifting of population densities. A railway line from Queenston to Chippewa was formed in the hopes of competing with the canal, but the escarpment, at the time, proved too much of an obstacle.

These effects were not felt too much by the rural section of the township as it continued to flourish. By 1830 it had a population of 2067, some of which was centred in the hamlets of Virgil and St. Davids. These farm centres had risen to supply their immediately surrounding areas with some of the everyday needs such as blacksmith shops and grist mills.

Of the 21,115 acres in farmsteads at this time, 9,459 were under cultivation. The area was becoming well cleared of its dense forests. Well cultivated farms and good houses and barns showed the improvements on the main roads. Log houses disappeared slowly, however, due to their exemption from taxes.

Dr. Thomas Rolph gives the following description of the area as it was in 1830.

"The pretty new village of St. Davids in this township, four miles from Queenston, is situated in most a delightful spot, embracing a great variety of picturesque and romantic scenery, being on a small stream called the 4 mile creek, from the undulating nature of the land - the extent of richly cultivated farms - the appearance of the peach and apple orchards - the numerous neat cottages and the well selected

sites for machinery".¹

x He has the following to say of the town of Niagara.

"The Town of Niagara, at Fort George, in the township of Niagara, is finely situated on the shore of the lake, at the mouth of the Niagara River, and opposite Youngstown, and is generally a scene of great bustle and gaiety. It has three churches, several taverns, large wharves, a spacious dry dock and harbour, and some handsome edifices around it. The population is upwards of 2000. Most of the steamboats running on Lake Ontario stop at Niagara; this year some have run to Queenston and Lewiston. The Transit, a beautiful boat, performs the voyage between it and Toronto daily."¹

Although the growth of Toronto and the advent of the Welland Canal deprived Niagara of much of its influence, it was still an important district centre. Hamilton, London and Chatham still came to Niagara for their goods until they outgrew the old capital. It was still a headquarters for regular troops and the chief seat of district courts. As late as 1842, three counties, Lincoln, Welland and Haldimand did their judicial business in Niagara.

Until 1845 the town of Niagara formed a part of the township, but in that year it was set apart as a separate municipality. In 1850 Niagara, which by then had reached its maximum population of 3,340, was incorporated as a town. The township seat was removed to Queenston and later the county seat was moved to the rapidly expanding St. Catherines, a larger more centrally located town.

With the shift of the concentration of population away

from Niagara towards St. Catherines and the head of the lake, Niagara, in the latter half of the century, began its decline. This was also induced by the improvement of interior roads, the building of the canal, and the coming of Railways. The township of Niagara, however, was on the threshold of a new era of prosperity and expansion.

1851 - 1955 The Period of Specialized Fruit Cultivation

With the beginning of a regular census in 1851 a clear picture of the settlement and the land use in the township at given dates was made possible. The 1851 census showed the population had risen to 2,250, and the amount of cultivated land had increased to 12,749 acres or about fifty-five per cent of the land in farmsteads. 8,845 acres were in field crops and only 313 acres in gardens and orchards. Of the 221 farmsteads 115 were over fifty acres and sixty-three were under ten acres. The majority were still large and as yet there was little concentration on fruit culture.

With the second half of the century, however, came the beginnings of a change from mixed farming to some specialization in fruit farming. The period 1851 to 1881 shows a marked increase in the number of acres devoted to fruit. A total of 2,039 acres plus another 177 in the town of Niagara were under orchards and gardens by 1881. This was accompanied by an increase of improved land to 19,377 acres and a resulting decrease of woodlot to 3,164 acres.

The reasons for this increase in fruit culture are varied. The well-drained soils of the lake plain and the accompanying moderate climate had proved conducive to the growing of tender tree fruits. The first commercial peaches, grown by John and

Joseph Brown of Niagara Township, were received favourably, and the growing industrialism and urbanization of Southern Ontario provided a large ready market for others who began production.

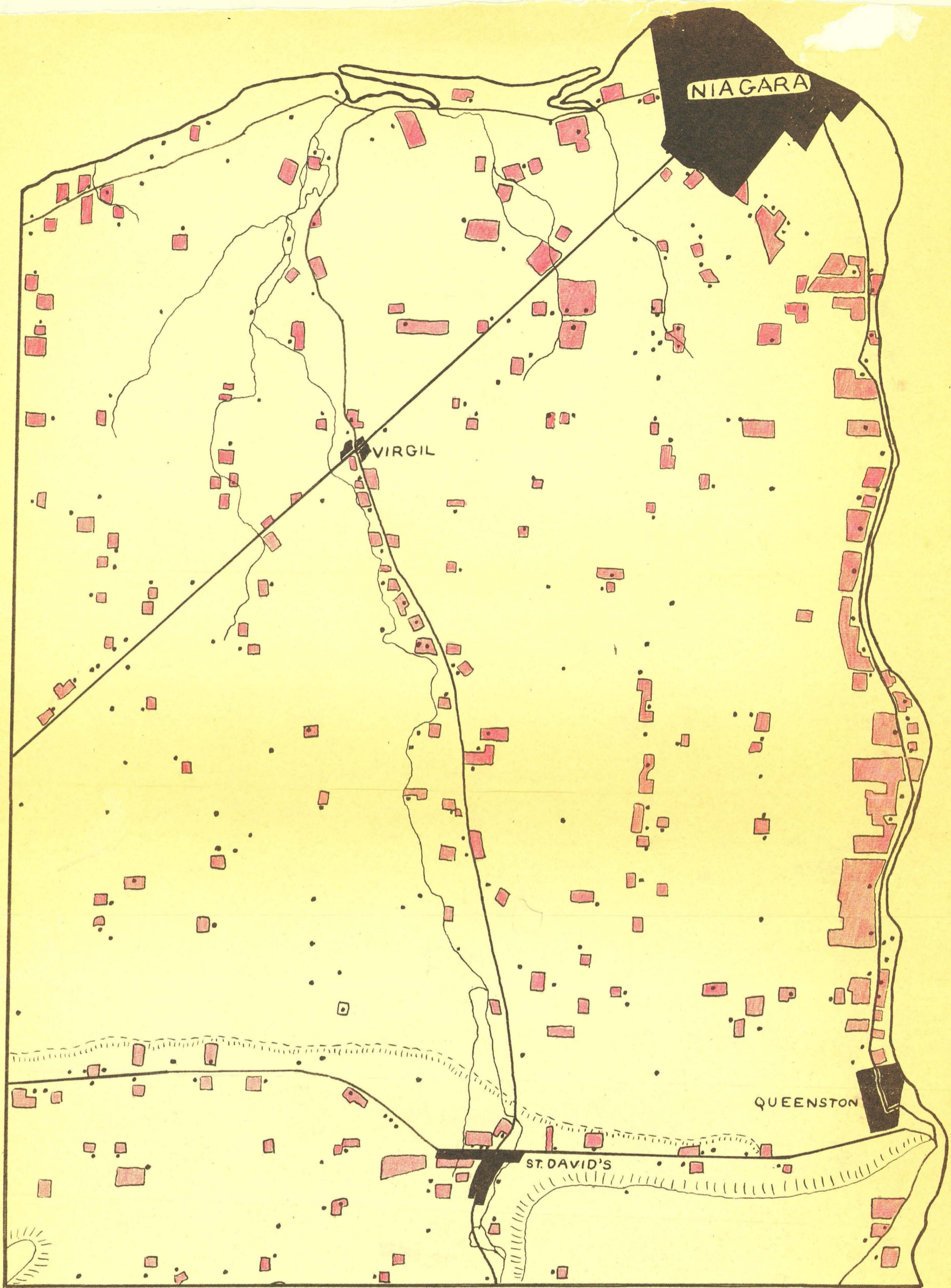
The marketing of the fruit was aided by the improvement of highways and roads, and moreso by the establishment of railroads. The latter enabled the shipping of perishable fruits safely over long distances.

Another boon to the industry was the introduction of canning factories first developed in Grimsby around 1856. They were later introduced in Niagara Township, one of the first being that established in St. David's by James Usher. These provided a use for the surplus harvest and gave full and part employment to some.

This period also saw the introduction of the cultivated grape, which before this had grown wild, by the government. Its ability to survive under more detrimental soil and winter climate conditions and where drainage is poor, gave a greater scope to fruit farming.

In 1863, the wheat crops of the township were greatly destroyed by insect pests. As a result, many farmers turned more to fruit in the following year. Also, by 1881, the new western parts of Canada had brought much competition to the wheat market, and this induced many to add commercial orchards to their farms.

The map found in Page's Historical atlas for 1876 indicates the changing economy and shows the location of orchards and farmsteads. (See Plate viii) The greatest concentration and the largest orchards appear, at that time



DISTRIBUTION OF DWELLINGS & ORCHARDS 1876

LEGEND

DWELLINGS

URBAN CENTRES

ORCHARDS



MAIN ROADS



STREAMS



OLD IRIQUOIS SHORE



ESCARPMENT

(AFTER W.E. TENCH)

0 1/2 1
Scale in miles

3

on the well drained sandy loams along the river road and around Niagara. In most other areas, except along the Creek Road, orchards are scattered and appear too small to be of much commercial value. The population also appears heaviest along the main highways and on the sand plains.

The expansion of fruit farming continued on into the twentieth century. The experimental work of fruit testing stations, set up in the last decade of the nineteenth century and replaced by the experimental farm at Vineland in 1907, did much to create expansion. Improved methods of soil management and better types of plants were introduced and, along with the use of tile drainage and drainage ditches to make more land available, helped to increase the quantity and quality of fruit grown.

By 1911 there was a notable increase of orchards up to 3,594 acres which did not include 613 acres in vineyards, 432 acres in vegetables and 198 acres in small fruits. Population was likewise increasing, having risen to 21522 in 1911, after a fall to 1845 by 1891, due to emigration to the west, and rising urbanism.

There was also a noticeable change in the number and size of farms by 1911. There were a total of 402 and of these 260 were under fifty acres and only thirty-eight over 100 acres. There were two causes for this change. The first was a breakdown due to family inheritance. The second and more important cause was the expense and intensification which accompany profitable fruit farming.

In this type of farming there is a great increase in the labour per acre required for pruning, cultivating and harvesting.

Increased capital investment is necessary for each acre, to allow for high initial cost created by the application of tile drainage where necessary, and the periodical loss of trees. This type of farming is, therefore, more easily handled on smaller farmsteads.

From 1911 until the present time the population continued to rise with the exception of the late twenties and early thirties when hard times sent many into the large cities looking for employment. During the depression, especially in the late 1930's, many Russian Mennonites arrived here ^{from the West} to settle. The loss of fertility in their soils had forced them to abandon their homes and they migrated largely to the vicinity around Virgil which became their commercial and religious centre. They worked diligently using latest soil improvement methods and became quite profitable farmers.

The total population by 1941 had risen to 3,346. The farms totaled 535,416 of which were under fifty acres and 175 under ten acres. Only thirty-three farms were over 100 acres. Some of the populace were only part-time farmers working, during the day or off-seasons, in St. Catherines and Grantham.

The total acreage of field crops had, by this time, dropped to 6,036 while that of orchards and gardens had risen to 10,034. Only 975 acres remained under woodlot and another 1209 acres in unimproved land. The basic interest was now in fruit culture. The war added great incentive to this and raised the total acreage under orchards, vineyards and gardens to 13,847.

Following the war there was a great deal of immigration from the war torn countries of Europe. This raised the total population to 5,101. Many of the new citizens were related to the Mennonites around Virgil and took up residence with them

while seeking jobs in the plants of nearby cities. Many of these decided to remain in the district causing an increase in the size of Virgil and decreasing the size of many of the farms in the township.

By 1951 which is the year of the latest census the total number of farms had risen to 650,591 of which were under seventy acres and 177 of these under ten acres. Another indication of the increase and domination of fruit farming was the decline in animals, especially horses and cows. In 1891 they totalled 1746 while in 1951 they decreased to 707. Horses have been replaced by modern tractors. Cows are kept by some for family needs, and by a few others for local needs. The latter are kept in spots where the land is not suitable to fruit growing. Most of the essentials are now bought in the local centres or larger cities nearby, and few are home-made. Thus we have an almost complete transformation from early subsistence farming to present day commercial fruit farming.

Chapter 3

TRANSPORTATION

Niagara Township is served by several good paved highways, and one single track railway which sees only limited service. Numerous gravel and dirt side roads, laid out in a grid pattern as seen on the key map, link the more remote sections of the township with the main roads and local and distant centres.

The most traversed highway in the township is the Queen Elizabeth which carries heavy through traffic the year around. It only passes through the southwest corner of the township and is not directly connected to any of the local centres. It is therefore unimportant in the township's immediate sphere of communication.

Other than this, the most heavily used road in the township is No. 8 Highway which connects Queenston with St. Davids, and both these with points west. It is greatly used by truckers, farmers and commuters all year. During the summer, however, it receives its heaviest load. It becomes a main artery for tourist traffic visiting the Niagara region or going to and from the United States via the Queenston Bridge.

Next in importance, and at times even more important, is the Stone Road which connects Niagara directly with Virgil and St. Catherines, and by way of the Creek Road, a secondary highway, to St. David's and Niagara Falls. This route is used heavily all year around by farmers and truckers, and by commuters working in St. Catherines.

The River Road, maintained by the Niagara Parks Commission, provides a more direct route from Niagara and Queenston to

Niagara Falls and is more heavily used by daily commuters. Being a scenic route, however, heavy truck traffic is prohibited and must use the Stone and Creek Roads. The River Road has a heavy quantity of traffic in the spring and summer months, especially on weekends.

The remaining paved road in the township, the Lakeshore Road, serves the northern section of the township, and connects Niagara with Port Weller and Port Dalhousie. It provides summer residents with a good road to their lakeshore cottages.

All roads in the township are well serviced by repair crews and are kept relatively clear and sanded during bad winter weather.

The only other method of transportation in the township, other than occasional ferry service to Youngstown, New York, and Toronto during the summer, is the Michigan Central Railroad spur line which connects Niagara with Niagara Falls. This was deemed unprofitable, however, and is used only for occasional industrial transportation. Likewise an electric railway connecting Niagara to St. Catherines from 1914 to 1932, did not pay and was therefore closed and the tracks removed.

Today, the only reliable communication with other centres is along the highways by means of private vehicle. The bus system is on the whole inadequate although quite regular during summer months. Connections with Niagara Falls were nullified except that going along No. 8 Highway and up the Creek Road from St. Catherines. At the most only twelve trips a day connect Niagara and St. Catherines by bus.

Chapter 4

PRESENT DAY AGRICULTURAL LAND USE

There are several factors which combine to produce the present land use pattern in Niagara Township. Climate has made the most important contribution in creating a dominant fruit culture not only in Niagara Township but in most of the peninsula lying north of the escarpment. The moderating effect of the lake has produced a climate most suited for the raising of luscious fruits, in particular, peaches. The winters are seldom too severe for the existence of fruit trees some of which cannot survive in temperatures below minus ten degrees Farenheit. The early Spring and long Summer also produce unexcelled flavours in the fruits. The early Autumn and late Spring frosts found elsewhere, especially above the escarpment, would prevent the ripening and the pollination of many of the tender tree fruits.

Whereas climate dominates the general location of tender fruits, other factors provide local limitations for specific species within the township, especially peaches and cherries. Soils and relief, and the resulting drainage conditions are the main delimiting factors. They provided the basis for the land types classification. Through a correlation of this with the land use map and with information received through observation and interview, it is possible to find the areas of domination by certain crops and the reasons for this domination.

The Sand Plains

These compose two large areas and several smaller, scattered patches of relatively well-drained sandy loams. They are occasionally interrupted by less favourable areas of clay

and clay loam, especially along stream courses. Peach orchards dominate the land use here.

Peaches have the most precise requirements of the temperate fruits. Good natural drainage is the most important soil factor. Good internal ^{drainage} is necessary to allow the roots to breathe freely and excessive external drainage must be prevented. Depressions, which act as frost pockets, are also disastrous to peach trees. Slope is therefore important. It must be kept to a minimum yet still enable adequate drainage.

The cultivation and care of the soils is important. Nitrogen is necessary and must often be supplied in Spring and early Summer, but is undesirable in late summer. In late fall, minerals (potash and phosphate) must be applied. Liming is also done here and throughout the township to correct over-acidity in the soil and to increase the effectiveness of manure or fertilizers. Cultivation of a short annual period, green manuring, farm manuring and the application of mulch are also required practices.

Some large farms are found in these areas, especially along the River Road where commercial peach orchards had their beginning, and along the Lakeshore Road. Several are still over fifty acres and one or two exceed 100 acres.

The majority of these sandy sections are in peach orchards. Some depressional areas and sections having poorer clay soils, however, are under pear and plum trees, field crops, hay, and occasional pasture. Most of the hay and grain is used as mulch for the orchards. This is spread around the trees to prevent the growth of other plants which would compete with the soil and moisture needs of the tree.



Fig. 5. A well-kept first class farmstead on the sand plain.



Fig. 6. An Early farmstead on the River Road. The size and quality of buildings indicate the larger, more valuable farms found on this part of the sand plain.

Woodlots are few, except along the east side of the River Road. The Niagara Parks Commission have left them standing to aid in prevention of erosion and to create aesthetic value for tourists. Sections of stream courses are also under woodlot to prevent erosion.

Those areas of good soil and drainage conditions, not under peaches, have been taken up by market gardening and sweet and sour cherry trees. The majority of the cherry trees in the township are found around the edge of peach orchards, although there are some solid orchards of cherries. They have much the same soil requirements as peaches but are in less demand, and because they are the first to be picked, their peripheral location is advantageous. They also provide a useful windbreak for the other trees.

The well-drained soils of the sand plains are also conducive to the growth of profitable garden crops, especially tomatoes and strawberries. Tomatoes are sensitive to excess moisture and desire shelter belts and windbreaks. They are, therefore, often found in small patches between orchards, but in places, occupy relatively large fields. Although they require much handling and attention, they mature quickly and may produce several harvests during a good season.

Strawberries are also dependent on good drainage. Although they will grow on a wide range of soils, the early types desire a light soil and a warm southern slope. Like tomatoes, strawberries mature quickly and provide a quick turnover for the money invested. Peaches, although they bring greater returns, require a longer investment period during the several years required for maturity. For this reason, many new post-

war immigrants began growing market garden crops.

This postwar immigration has brought a noticeable breakdown of the farm sizes in the sand plains, especially near Virgil. Many farms today are less than ten acres and many are looked after by the women while their husbands work days in the industries of Niagara Falls and St. Catherines.

The Iroquois Till Plain

This comprises all the land, north of the old Iroquois shoreline, which has not been overlain by lacustrine sand deposits. The majority of the soils here are clays and clay loams of heavier texture and poorer drainage than those soils on the sand plains. Grapes dominate the landscape in this area although they are less prevalent than peaches are in the area previously discussed.

Grapes produce best on light textured sandy soils, but are less exacting than peaches and can thrive on more detrimental clay soils providing that surface drainage is efficient but not excessive. This problem has been solved by the development of drainage ditches in many cases using the natural channels of two, four and six mile creeks, at the expense of the farmers who used them.

Grapes also thrive on abundant sunshine and heat. This is insured by placing the rows in a north-south direction. Also, it can be seen that most large vineyards are located some distance away from the lake which has a moderating effect on the desirable summer heat.

Good air circulation is also necessary to combat against disease and frost, although vines will stand up to low winter temperatures. Limited cultivation is advised in early spring



Fig. 7. One of the few unimproved farmsteads on the till plain.



Fig. 8. Market gardening on the till plain.

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with none after the end of June. The use of farmyard manure, artificial fertilizer, and green manure are also common practices, the last being most important in preventing the leaching out of nitrogen and to hold winter snow thus preventing deep freezing.

The largest farms on the till plain are those owned by Canadian Cannery at St. Davids and which specialize in tree fruits and market gardening, and those owned by Bright's Wines specializing in grapes. Canadian Cannery have, in recent years, dispensed with many of their farms, finding that it is cheaper to buy from the private farmer. Brights, however, do research and experimentation on their farms to produce the best grapes possible.

Despite poor natural drainage, many peach orchards and market gardens are found throughout the till plain. The use of tile underdraining and the drainage ditches have made this possible. Over 700,000 dollars have been spent in artificial drainage throughout the township. As a result of the high initial capital which this requires many farms have been reduced to less than fifty acres, and some to less than ten acres.

The many Mennonite and Polish immigrants who came to this township since the last war, leased small plots of land. They worked in the urban industries to provide the initial cost of tile drainage and trees, and to provide an income while the trees were maturing. Many still work in industry, leaving their hardworking wives to care for the farm during the day.

These new immigrants were allowed to live in crude tarpaper shacks, without restriction, until they were able to build



Fig. 9. A small dairy herd on the till plain near Virgil, Ont.



Fig. 10. The pasturing of beef cattle on the poorer soils of the lake plain, showing one of the few remaining woodlots in the background.

proper homes. Many of the Poles, having become used to such a life, and desiring to stay in a lower tax bracket, remained in these dwellings until fines and law forced them to build proper homes in which the majority live today.

A few poorly constructed, unkept houses can still be seen along the backroads of the till plain.

This area contains the majority of the land of the township in field crops, hay and pasture. Wheat and oats are dominant and are used for feeding cattle, poultry and swine. Very little is sold commercially. Much of the straw and some of the hay is used for mulch to protect orchards and small fruits during the winter months.

The lake plain contains most of the cattle in the township. There are only a few herds of dairy cattle, the largest being located just south of Virgil. The majority are owned singly by farmers for their private use. This is especially true, away from the main highway where cows are found periodically, staked to the side of the road or in a small pasture. Some small herds of beef cattle are also found in more remote sections, and are sometimes mixed with dairy herds.

Chickens and swine are quite numerous in this part of the township they provide a secondary income for many farmers and in this way give some protection against fruit failures.

The amount of woodlot is also greater here. It is found in areas too poor for farming, and especially along creeks and drainage ditches to prevent erosion. Many farmers have kept a woodlot on their farm to provide winter fuel.

The Dissected Till Plain

This is a rolling dissected, gravelly terrace overlain by

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clays and clay loams. It extends from the lake plain south to the escarpment and extends east and west accross the entire township. Although the soils are heavy, the rolling nature of the land provides some well drained sections.

There is a great diversity of crops here. Small peach orchards are grown on well drained, protected knolls but pears and plums dominate the tree fruits with a few patches of apple and apricot trees. While apples were previously a dominant part of the fruit economy, other, more specialized areas provided too much competition and apples were soon replaced by more profitable fruits.

Grapes, field crops and hay are found on the poorer drained and steeper sections of this terrace. Few grapes are found against the escarpment, however, due to the danger of late spring and early fall frosts. They are replace by pears and plums, the most tolerant of the tree fruits.

Woodlots are confined mainly to the stream courses where they prevent erosion. This is also a problem on the slope which separates the terrace from the lake plain. Most of this land has been left in permanent grass cover. Grass is also used on slopes as a soil binder between the trees, and the grape trellises.

The farms in this region, compared to those around Virgil, some even exceeding fifty acres. A few have been broken up, however, especially along the Creek Road south of St. David's and along No. 8 Highway. Housing subdivisions have diminished the farmland somewhat, and will continue to do so, as urban housing needs rise. Farmers are attracted by the good prices offered for their land.

The Escarpment

The slopes of the scarp face are too steep for other than forest cover. Mixed coniferous and deciduous forest provide this cover which extends from the river to the St. David's Valley, and is found in two areas west of this. This area is free of any human dwellings.

The Clay Plain

Most of this region, which comprises all of the township above the escarpment, has been taken over by power developments which will be discussed in a later chapter. Most of the part in agricultural use is under field crops, pasture and woodlot. Some grapes are grown and some orchards but no peaches or cherries. The poorlydrained level terrained clays and the more rugged temperatures prevent the growth of the more tender fruits. Mixed farming is predominant and farms are as a result much larger than below the escarpment.

Problems in Agricultural Land Use.

In the township as a whole, drainage and acidity have been the major physical problems. The construction of drainage ditches and the extensive installation of tile under-draining has alleviated the first problem, while heavy periodical application of lime has been used to decrease acidity. Moderate acidity, however, is conducive to the fruits grown here. These efforts have caused large investment of the land but also have produced good productivity.

Erosion, especially that by running water, has not proved too serious in the township. The majority of the land is quite level, and controls have been used on the undulating sections.



Fig. 11. A man-made drainage ditch on the till plain west of Virgil, making possible the cultivation of peach orchards seen in the background.



Fig. 12. Surplus baskets of peaches to be used as fertilizer due to the summer heat wave in 1955.

Lake shore erosion through wave action, however, is more serious. Waves from occasional heavy storms often hill fruit trees within their range. Prevention measures are too costly for the average farmer, however, and little has been done to check it. Less than one quarter of the lake front is under farmland today, most of it going to tourists' cottages and military land.

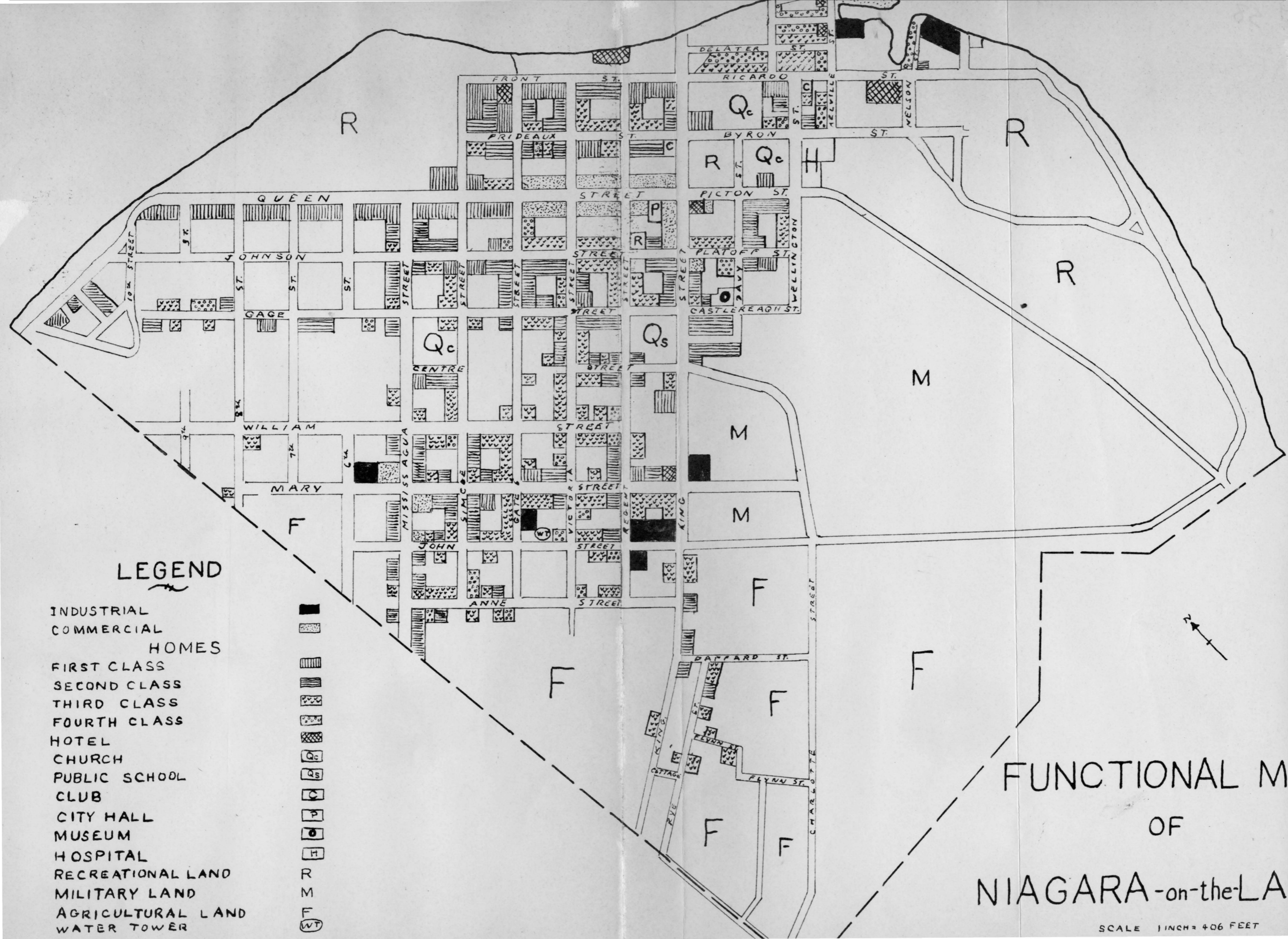
The most serious problems facing the township's farmers at the present is overproduction. This is the result of two major factors. The first is the rapid increase of land devoted to fruit production since 1939 due to a stimulus in the market by war. This has increased the total amount of fruit on the market. Second is the improvement of species and the widespread use of sprays which have decreased the loss through disease and pests. This has produced a critical situation.

This problem was emphasised in the summer of 1955. As a rule the harvesting and marketing of peaches is spread out over about a ten week period in which different varieties ripen at different times. An unusually warm summer in 1955 caused the early maturity of some varieties. Many had to be dumped because of under-development but many others were marketed before schedule and caused a flooding of the market. To enable the prices to be kept up, many others had to be dumped and used merely as fertilizer.

Since 1939, the cost for labour, baskets and spraying has nearly doubled whereas the selling price of fruit has risen very slowly. As a result, many farmers just break even while other have a deficit. Some must take employment in the city or with the government during the winter months to keep their farms

operating. The large initial amount invested in fruit culture prevents many from switching to mixed or dairy farming, and the capital investment puts the land at such a high price that farmers find it hard to get buyers if they wish to sell.

To relieve the situation which exists, an attempt was made by fruit growers of the peninsula to get the provincial government to set up a Fruit Grower's Marketing Board. This was to be a government controlled attempt to stabilize the market by buying up the surplus produce at prevailing prices. In short, it was to act as an indirect subsidy to the fruit farmer, but as yet the idea has not materialized.



LEGEND

- INDUSTRIAL
- COMMERCIAL
- HOMES
- FIRST CLASS
- SECOND CLASS
- THIRD CLASS
- FOURTH CLASS
- HOTEL
- CHURCH
- PUBLIC SCHOOL
- CLUB
- CITY HALL
- MUSEUM
- HOSPITAL
- RECREATIONAL LAND
- MILITARY LAND
- AGRICULTURAL LAND
- WATER TOWER

FUNCTIONAL MAP
OF
NIAGARA-on-the-LAKE

SCALE 1 INCH = 406 FEET

Chapter 5

NON-AGRICULTURAL LAND USE

Niagara-on-the-Lake

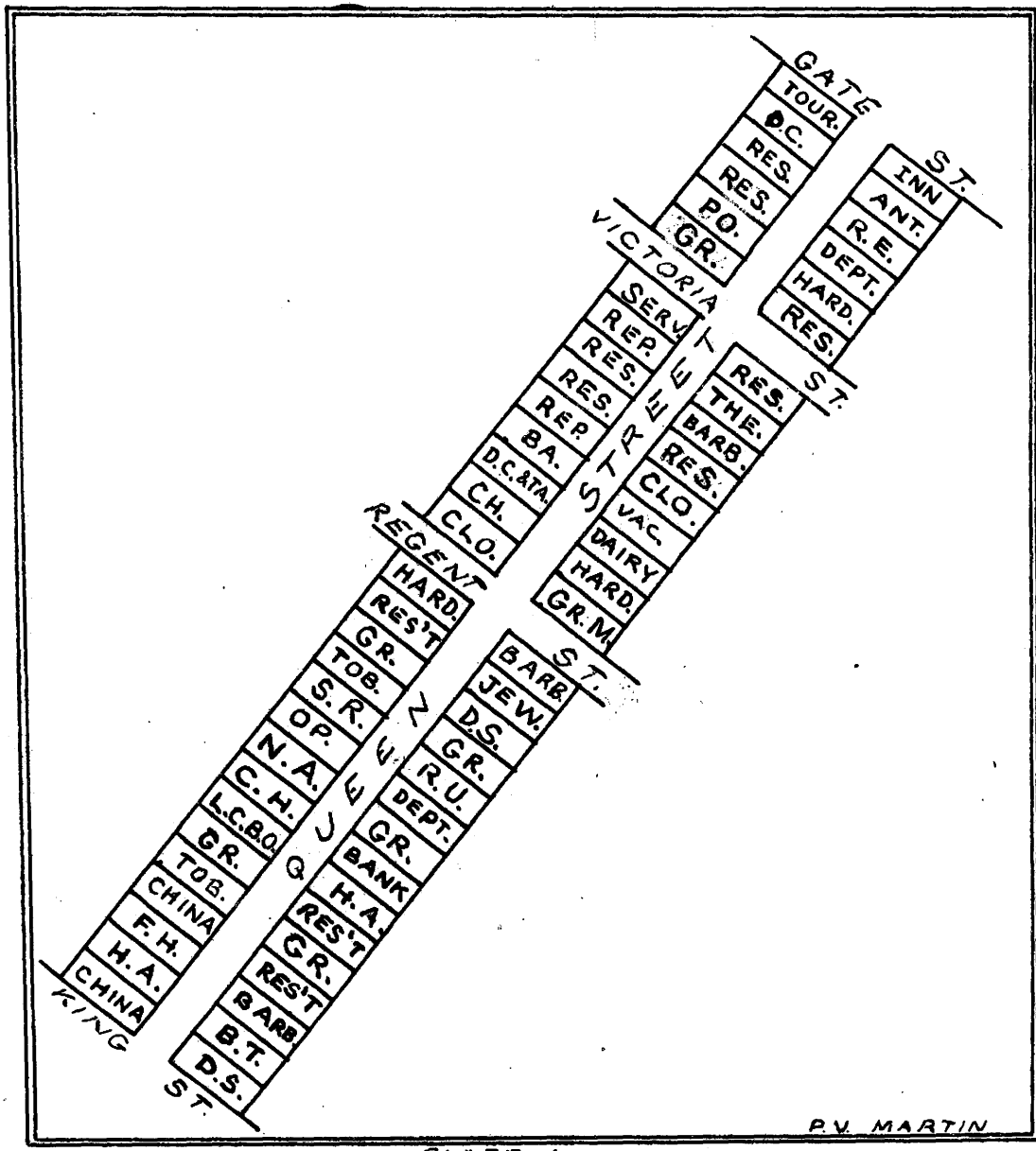
This town of 2,535 people is located at the mouth of the Niagara River about fifteen miles north of Niagara Falls and approximately nine miles northeast of St. Catherines. It is also located on a branch of the Michigan Central Railway, once a busy section, but now almost abandoned except for an occasional shipment of coal or lumber for local industry.

Although once a retail and wholesale trade centre for the entire province, Niagara has long since lost this prominence to more conveniently located urban centres. Today Niagara gains its importance as an agricultural centre and also, since the improvement of transportation routes and facilities, as a summer resort and tourist town. Although this has done little to increase permanent population, it has aided the town's annual revenue.

Niagara has many natural attributes for this latter function. Its location beside the lake gives it a more comfortable climate than inland urban centres. The natural beach and the ample docking facilities left from past functions answered recreational needs, and to these were added a golf course on the grounds of old Fort Mississagua.

Niagara's greatest attraction is its historical background. It is a treasure house of monuments and memories lying at the foundation of Ontario. This provides a desirable cultural atmosphere for summer visitors.

Although there has been some industrial development,



P.V. MARTIN

PLATE 10

COMMERCIAL DISTRICT OF NIAGARA-on-the-LAKE

| | | | |
|----------------------|-------|------------------------|-------|
| TOURIST HOME..... | TOUR. | ANTIQUE SHOP..... | ANT. |
| DRY CLEANERS..... | D.C. | REAL ESTATE OFFICE.... | R.S. |
| RESIDENCE..... | RES. | DEPARTMENT STORE.... | DEPT. |
| POST OFFICE..... | P.O. | THEATER..... | THE. |
| GROCER..... | GR. | BARBER..... | BARB. |
| SERVICE STATION..... | SERV. | VACANCY..... | VAC. |
| REPAIR GARAGE..... | REP. | GREAVE'S JAMS..... | GR.M. |
| BAKER..... | BA. | JEWELLER..... | JEW. |
| TAILOR..... | TA. | DRUG STORE..... | D.S. |
| CHILDREN'S SHOP.... | CH. | RUGS & UPHOLSTERING.. | R.U. |
| CLOTHIER..... | CLO. | HOME APPLIANCES..... | H.A. |
| HARDWARE..... | HARD. | BELL TELEPHONE..... | B.T. |
| RESTAURANT..... | REST | SHOE REPAIR..... | S.R. |
| TOBACCO STORE..... | TOB. | OPTOMETRIST..... | OP. |
| NIAGARA ADVANCE.... | N.A. | CITY HALL & LIBRARY.. | C.H. |

LEGEND

FIRE HALL F.H.



Fig. 13. Looking east on Queen St.,
the commercial district
of Niagara-on-the-Lake.



Fig. 14. The Niagara River, and Shepherd's
Boat Works, Niagara's largest full
time industry, as seen from
Fort George.

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partially due to the growing fruit industry, Niagara is still primarily a service centre for the surrounding agricultural district and for the summer tourist trade. In 1954 it is estimated that over 50,000 people visited Fort George, the greatest attraction within the town limits. In 1955, with the development of winter ice jams on the river, the presence of the world scout jamboree and the Lake Ontario swim, many more visited the area and greatly increased the transient trade.

The present commercial area of the town as depicted on the accompanying maps consists of thirty-three retail stores plus numerous service establishments. Most of the stores handle largely the common articles of immediate everyday need and of limited selection. Many things, especially luxury goods, must be purchased at the larger stores located in Niagara Falls and St. Catharines. The off-centre location of the commercial section has been somewhat of a hindrance to its growth. When the present town site was surveyed and laid out in 1845 the proposed centre was to be at Mississagua and Mary Streets where the Stone and Lakeshore Roads intersect. Fort George, however, which had previously provided a large market for retailers, induced businesses to become located near it, on Queen Street, although its population soon became defunct. The existing businesses attracted any new additions until the present commercial area was developed. This location plus the rise of Virgil may have reduced Niagara's zone of influence.

The existing industries in Niagara consist of two canning factories, one jam factory, three basket factories, one wood-working shop and a boat building factory. All but the last are either seasonal or employ so few that they are relatively

unimportant.

Canadian Cannerys, while they employ over 300, mostly transient, labourers during the harvesting and canning season, employ only seven permanent workers. This is true of the other industries connected with the fruit culture. Most of these plants are located on the outskirts of town or near the railway which formerly gave ease and quickness of transportation. Greave's jam factory, however, is located in the commercial district where it is able to sell as well as to manufacture.

The largest industry in Niagara is Shepherd Boats, makers of high priced inboard and outboard motor boats. They employ upwards of forty permanently, most of whom are skilled woodworkers and many of these being foreign immigrants. Their location in Niagara by the water front was probably due to the ready market for their products in the Niagara vicinity and across the river at Youngstown, the availability of a testing area, and the moderate climate desirable for this type of work.

The total selling value for all the plants in Niagara in 1951 was 871,000 dollars. The outlook for future expansion of industry, however, is dim. The only inducement Niagara has is a rail and water connection. The water transportation other than for pleasure craft and for occasional ferries to Toronto and Youngstown, has been neglected since the first decade of the century. Likewise, in the last few years, the rail route has been used only sparingly due to more important interests elsewhere in the peninsula.

Residential Niagara consists of 854 homes. These are nearly all single family dwellings of frame construction. Many are of early construction, some dating back to the early 1800's. While some have been kept up and modernized, others have been left



Fig. 15. A first class house in
Niagara-on-the-Lake.



Fig. 16. A fourth class shack on the
southern outskirts of Niagara-
on-the-Lake.



Fig. 17. An N.H.A. subdivision in
Niagara-on-the-Lake
(second class housing)



Fig. 18. An elementary school in
Niagara, Ont., built on
the site of the first
parliament of Upper Canada.

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relatively untouched due to the historical pride of their inhabitants. As a result there is great decadence in some areas.

Since 1945, there has been some influx of building, especially by N.H.A., for veterans working mostly in the industries of St. Catherines and Niagara Falls. These consist of well kept second class frame houses found mostly in a new subdivision on the military reserve. There are also a few post-war, first class, ranch style houses intermingled with the older dwellings.

The biggest concentrations of first class homes are those owned by American summer residents along Queen Street, and those along Front Street. The rest of the residences are found, for the most part, in the area east of Mississagua Street and north of John Street. Many of the larger homes located on the main streets become tourist homes during the summer months.

Lack of development west of Mississagua Street can be blamed largely on the presence of the city garbage dump which, due to prevailing winds, gives off unpleasant odours. In other parts of the town much of the area has remained in farmland and in military reserve. The latter has been an army camping and training grounds since 1914 and, for several weeks each summer, is occupied by reserve soldiers.

The town is served by a water system and accompanying sewage disposal system. It is protected by a fire hall and by a modern, well-equipped hospital. A large park and beaches provide recreational facilities. These are accompanied by a movie theatre, several clubs including the first Masonic Lodge in Canada, and several beverage rooms.

A modern public school is provided and a new high school



Fig. 19. St. Mark's Anglican Church
in Niagara, built in 1804.



Fig. 20. St. Andrew's Presbyterian
Church in Niagara, built
in 1831.

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is in the process of being built in conjunction with the township. At present children of high school age must go to Niagara Falls or St. Catherines where their education is bought. They are served by school buses.

Culturally, with its historical background, Niagara is well set. It contains four churches, all having historical significance. It also contains a museum and the first library in Upper Canada. In the summer it contains a stock theatre. These, along with the numerous historical sites and monuments, make Niagara a cultural centre.

The future development of Niagara depends largely on the expansion of industry in the Niagara Falls and the St. Catherines districts. It has all the qualities desirable for a suburban residential town, including a more favorable climatic situation for more comfortable living conditions.

Industrially or commercially Niagara shows little hope for expansion.

St. David's

This village is situated eight miles from Niagara by road, at the junction of two old Indian trails which today comprise No. 8 Highway and the Creek Road. It had its beginning near the end of the eighteenth century as a trading post and later as a local manufacturing and supply centre. The water of Four Mile Creek provided power needed for mills and other industries.

Like Niagara, St. Davids was burned in 1813 and lost many inhabitants and industries. With agricultural advancement in the township, however, it became a centre for the surrounding district. Because of its location a canning factory was



Fig. 21. Canadian Cannery's factory at St. David's, showing a peach orchard in the left foreground.



Fig. 22. A suburban housing development on No. 8 Highway west of St. David's.

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developed here, one of the first in the township. The development of a cement and stone quarry above the escarpment in the later 1800's also aided St. David's. These are the only industries located here today.

At present St. David's, with a population of over 900 and 316 homes, is primarily an agricultural centre and a suburb, mainly for Niagara Falls. Most of the homes are frame and many are post war. Many of the inhabitants of the town are commuters. A great attraction to these people is the local golf course.

The commercial section reflects the situation. Three grocery stores, a post office, a bank, a hardware store and several service stations and garages, supply the everyday essentials while Niagara Falls stores provide luxury articles. A lumber and building supplies store emphasises the new development of suburban homes in the area. Restaurants and part-time tourist homes indicate a summer tourist trade along No. 8 Highway.

Like Niagara this town has little incentive for any development other than residential.

Virgil

This is a village of between 600 and 700 people located at the junction of the Creek Road and the Stone Road, about three miles southwest of Niagara. Although it had its beginnings with the coming of the United Empire Loyalists, its greatest development has occurred within the last quarter century.

During the depression, Mennonites settled the land around Virgil and, being very religious and clannish, built a large church in the village which they made their cultural centre.



Fig. 23. The commercial section of Virgil, looking southwest along the Stone Road.



Fig. 24. A fruit co-operative on the Creek Road, in Virgil, where peaches and other fruits and vegetables are bought and sold wholesale.



Fig. 25. The Mennonite Church, centre of cultural activity in Virgil.



Fig. 26. The Mennonite Bible School on the Stone road northeast of Virgil, Ont.

Those who became too old to work the land retired and built homes in Virgil near the church, their one remaining interest in life. This brought an increase of the village population.

After 1945 many Mennonite immigrants came to live with their relations while seeking employment in Niagara Falls and St. Catherines. Because of family and religious ties many of these people decided to live in, or around, Virgil and become commuters like those in Niagara and St. David's.

Virgil has thus developed into a thriving residential village of 210 homes, and a cultural centre. A large commercial district has also developed along the Stone Road. It consists of eight service stations and a used car lot, three grocers and a meat market, two restaurants, a drug store, a barber, a real estate office, a hardware, a bank and two appliance stores. There is also a wholesale buyer and seller of fruit employing mostly seasonal labour, and a small furniture industry and store, employing about six people.

The fact that this is a cultural as well as a commercial centre is illustrated by the presence of three churches, the largest being Mennonite. The future development of Virgil, like other centres in the township, depends on the industrial growth of the larger centres outside the township, and on the trend towards suburban living. Virgil, however, has less attractions than St. David's and Niagara, except to incoming Mennonites.

Queenston

Situated on the Niagara River, immediately below the escarpment, Queenston, with a present population of 415, is the smallest urban centre in the township. It is at the head of navigation on the Niagara River and was an important transfer



Fig. 27. Queenston, as seen from Brock's Monument on Queenston Heights, showing the lake plain and steep river cliff in the background, and new suburban housing developments in the left foreground.



Fig. 28. An early style first class home on the River Road north of Queenston.



Fig. 29. A modern first class ranch style home on the River Road north of Queenston.

point for cargo going across the portage to and from Chippewa and the interior.

Today, although the population has risen, it is almost entirely composed of commuters working mostly in Niagara Falls. The only signs of commercial activity are the toll bridge across the river, a general store and post office, the township offices and a few service stations.

Growth here is also restricted to residential development influenced by the industrial expansion of larger centres, especially Niagara Falls.

There have been recent developments of suburban homes other than in the urban centres previously mentioned. These have been restricted mainly to No. 8 Highway and the River Road. They consist almost entirely of ranch-style houses, with the exception of several mansions of earlier origin located on the River Road north of Queenston. The homes on the River Road are more expensive and have settings with greater aesthetic value.

Two other urban developments appear on the Stone Road between Virgil and Niagara. The first is a Mennonite Bible School, a private high school which attracts students from as far away as Kitchener. It is a recent acquisition and is still being built through Mennonite labour. Near this location the new town and township high school is also being built.

There is also an industry, the Avionics Company. It is located nearer Niagara on the bank of Two Mile Creek. It is the aero-electronics division of the Gen-Air Company of St. Catharines and, although it employs only a few at present, may be the nucleus of a larger development.

The remaining non-agricultural land below the escarpment, excluding recreational land which will be discussed later, is to be found in military reserve. This is used, in conjunction with the camp at Niagara, as rifle ranges and for field maneuvers.

In that part of the township above the escarpment, well over two thirds of the land is used for non-agricultural purposes. A small part of this is being quarried for limestone by Queenston Quarries. This also included a cement works until better types elsewhere made cement production unprofitable.

The quarry face is about twenty-six feet. This includes twelve feet of grey dolomite underlain by fourteen feet of bluish dolomite in beds of six inches to six feet. The upper beds are of a warm grey colour and are very fine-grained, allowing them to take a high polish and making them good for ornamental purposes.

The majority of the land above the escarpment has been taken over by the Hydro-Electric Power Commission of Ontario. Development began in 1914 when surveys were made to build a powerhouse at the base of the river cliff about one mile south of Queenston. A forebay and screenhouse were planned to feed the powerhouse and were in turn to be fed by a canal from the Welland River. This site was ideal for height, construction and future expansion.

This project was put under construction and was completed in 1921, providing the surrounding district and more distant centres with much needed power. As yet, however, not much land was necessary, and it remained in mixed farming, vines and orchards.

In 1951, however, a second power project of much greater



Fig. 30. The Avionics Industry on Stone Road, southwest of Niagara-on-the-Lake.



Fig. 31. Fort George, at Niagara-on-the-Lake, one of the many tourist attractions kept up by the Niagara Parks Commission along the River Road.

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magnitude was put under construction. Although the powerhouse was erected in Stamford Township, the majority of the reservoir, built to insure a steady flow of water, is to be found in Niagara Township. As a result, most of the land above the escarpment has been taken over by non-agricultural land uses.

Recreational Land Use.

This consists of two major types, that occupied by summer cottages and that occupied by Niagara Parks Commission.

The location of summer cottages in the township is confined to the lake front where the moderating influences of the lake provide desirable summer temperatures and the sandy beaches provide a good natural playground. There are two areas of concentration, one adjacent to the town of Niagara, and known as the Chautauqua grounds, and the other near the northwest corner of the township.

The Chautauqua derives its name from a summer town in New York State where people convened to learn culture and study the bible. An attempt was made to set up a similar place beside Niagara in 1887 with the building of a hotel and a number of homes circled around an amphitheatre, but the idea fell through. Today, however, the area contains close to 100 summer homes, many of which are owned by Americans. Among these are about thirty second rate cottages which have been converted into permanent homes by commuting residents.

The western section of the shore contains several cottages all of which have lake frontage. These are more secluded and of a better class than those in Chautauqua.

The remainder of the shoreline is occupied by farmland and military rifle ranges. These may provide future sites for

recreation land, especially that under orchards if the price of land becomes right.

The Niagara Parks Commission own much of the Land along the River Road stretching from Lake Ontario to Lake Erie. Where possible, they have made it into parks and picnic grounds for transient tourists. Monuments have been established at most of the historical spots and they attract thousands of motorists each year.

Beyond the town of Niagara the major attraction is located above the escarpment. This is the Brock monument and its accompanying park. This has facilities for picnics including a pavilion, a refreshment booth and a restaurant. The monument itself enables one to have a bird's eye view of the countryside around.

CONCLUSION

From this study it can be concluded that the location of the township, below the escarpment and adjacent to Lake Ontario, has been the most important factor in the evolution of the present day land utilization in Niagara Township. This has created a moderate climate, free of winter extremes, which has combined with man's improvement, of soil and drainage to permit the emergence of a dominant fruit culture. This was also aided by transportation improvements, the proximity and growth of urban markets, and more important, the development of canning.

Today the major problem is overproduction and the flooding of markets. This has been induced by World War Two's stimulation of efforts, the use of fertilizers and drains to make more land available, and the use of research and sprays to decrease the death rate of fruits due to disease and insect pests.

The situation is almost acute. This excess may be absorbed by a growing trend towards urban development which would create larger markets. Attempts have been made to obtain indirect government subsidies but, so far, they have been unsuccessful. Many farmers at present find it hard to make profit or even break even, but have invested too much to sell, except at prices too steep to attract buyers.

The four urban centres were all found to have no strong location factors to induce development of industry or commerce. There are, however, good possibilities of future development as suburban centres, but this will produce a very slow increase of population.

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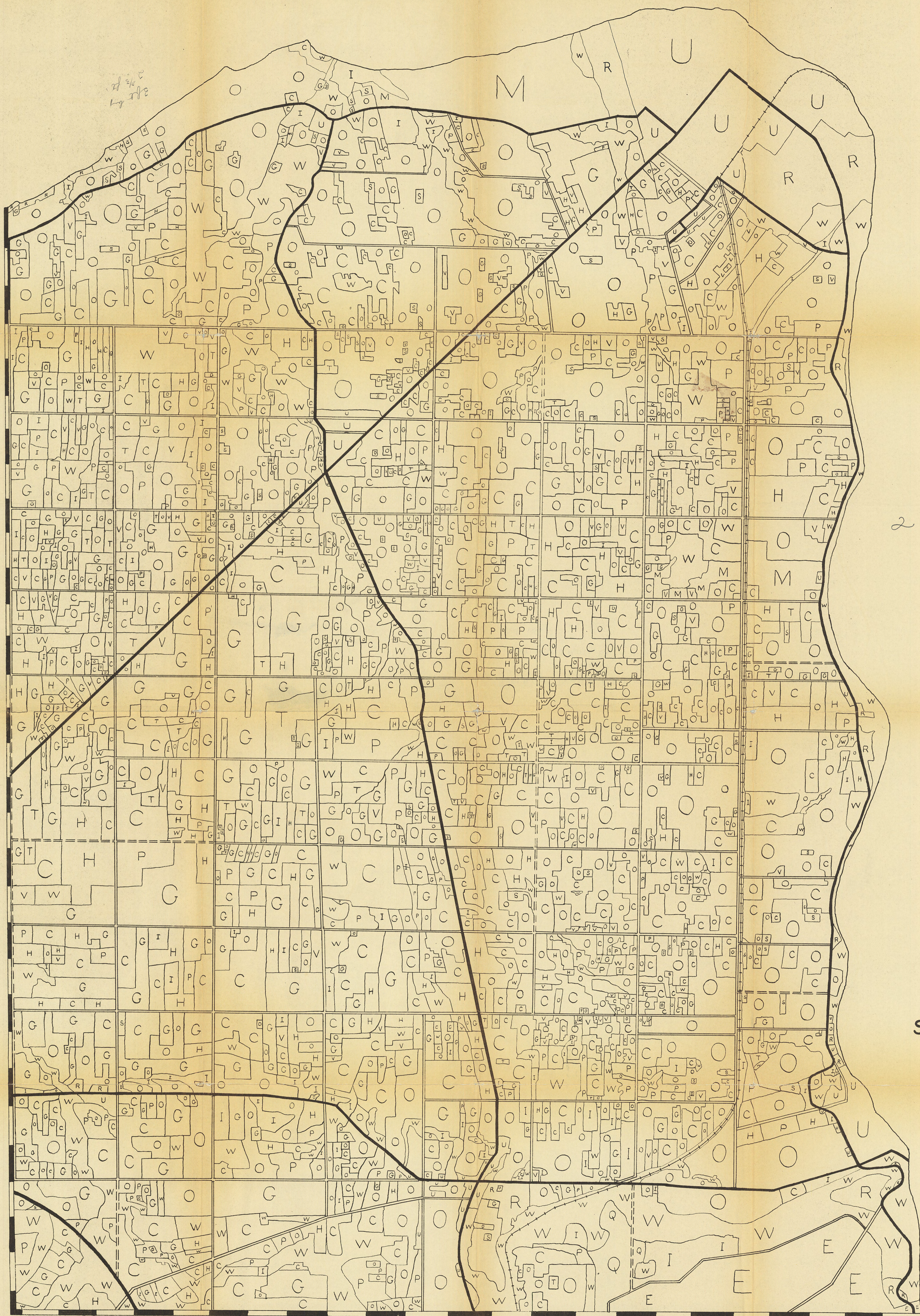
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PRESENT LAND USE 1955

LEGEND

| | |
|--------------------|------|
| GRAIN | [C] |
| HYDRO DEVELOPMENTS | [E] |
| GRAPES | [G] |
| HAY | [H] |
| 2 IDLE LAND | [I] |
| MILITARY RESERVES | [M] |
| ORCHARDS | [O] |
| PASTURES | [P] |
| QUARRY | [Q] |
| RECREATIONAL LAND | [R] |
| STRAWBERRIES | [S] |
| TOMATOES | [T] |
| URBAN LAND | [U] |
| MARKET GARDENING | [V] |
| WOODLOT | [W] |
| PAVED HIGHWAY | — |
| UNPAVED ROAD | — |
| UNUSED ROAD | ---- |
| RAILROAD | ++++ |
| TOWNSHIP BOUNDARY | ▬ |

SCALE 4 INCHES = 1 MILE



NIAGARA TOWNSHIP