A GEOGRAPHICAL STUDY

OF

NORTH DUMFRIES TOWNSHIP

A Thesis

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Bachelor of Arts

by

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INTRODUCTION

Bio-physical and cultural geography are two major divisions of this science. A geographical study may be based on one or both of these aspects, discussed systematically or regionally. The historical factors of a geographical study may be discussed in relation to the present and as an entity in itself.

The following discussion of North Dumfries Township is, for the most part, a regional study of the present physical and cultural relationships, especially land use, although a short discussion of the historical geography of the township is included.

Information for the study was gained from various sources. The field work was done in the fall of 1957 and involved a series of traverses through the township and numerous interviews with farmers and townsfolk. References were made to a number of books and pamphlets, listed in the bibliography, and to aerial photographs and topographic maps of the township.

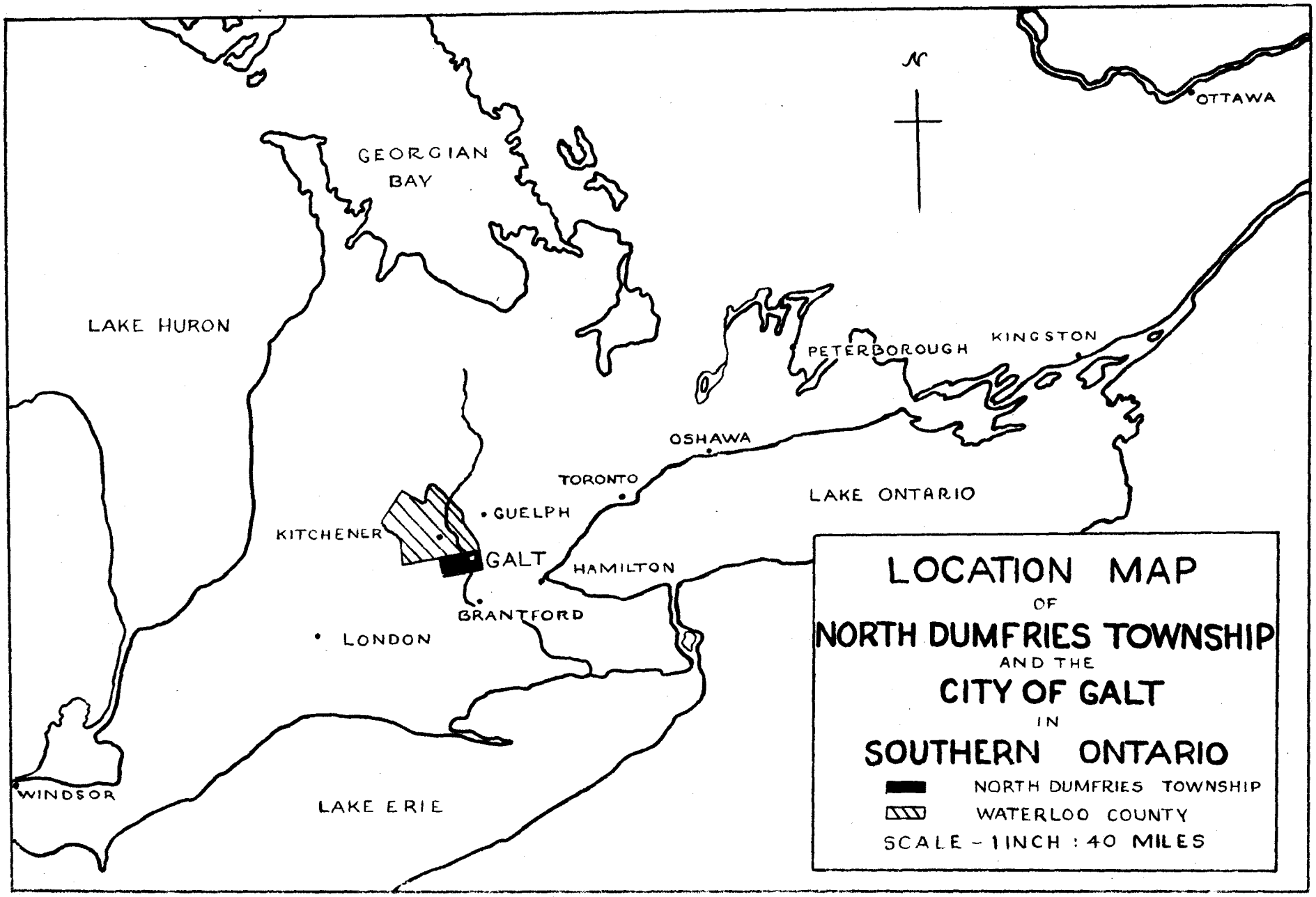

N
OTTAWA
GEORGIAN BAY
LAKE HURON
PETERBOROUGH
KINGSTON
OSHAWA
TORONTO
LAKE ONTARIO
GUELPH
KITCHENER
GALT
HAMILTON
BRANTFORD
LONDON
WINDSOR
LAKE ERIE
LOCATION MAP
OF
NORTH DUMFRIES TOWNSHIP
AND THE
CITY OF GALT
IN
SOUTHERN ONTARIO
NORTH DUMFRIES TOWNSHIP
WATERLOO COUNTY
SCALE - 1 INCH : 40 MILES

FIGURE 1

CHAPTER I

PHYSICAL GEOGRAPHY

1. Location, Shape, Size and Relief

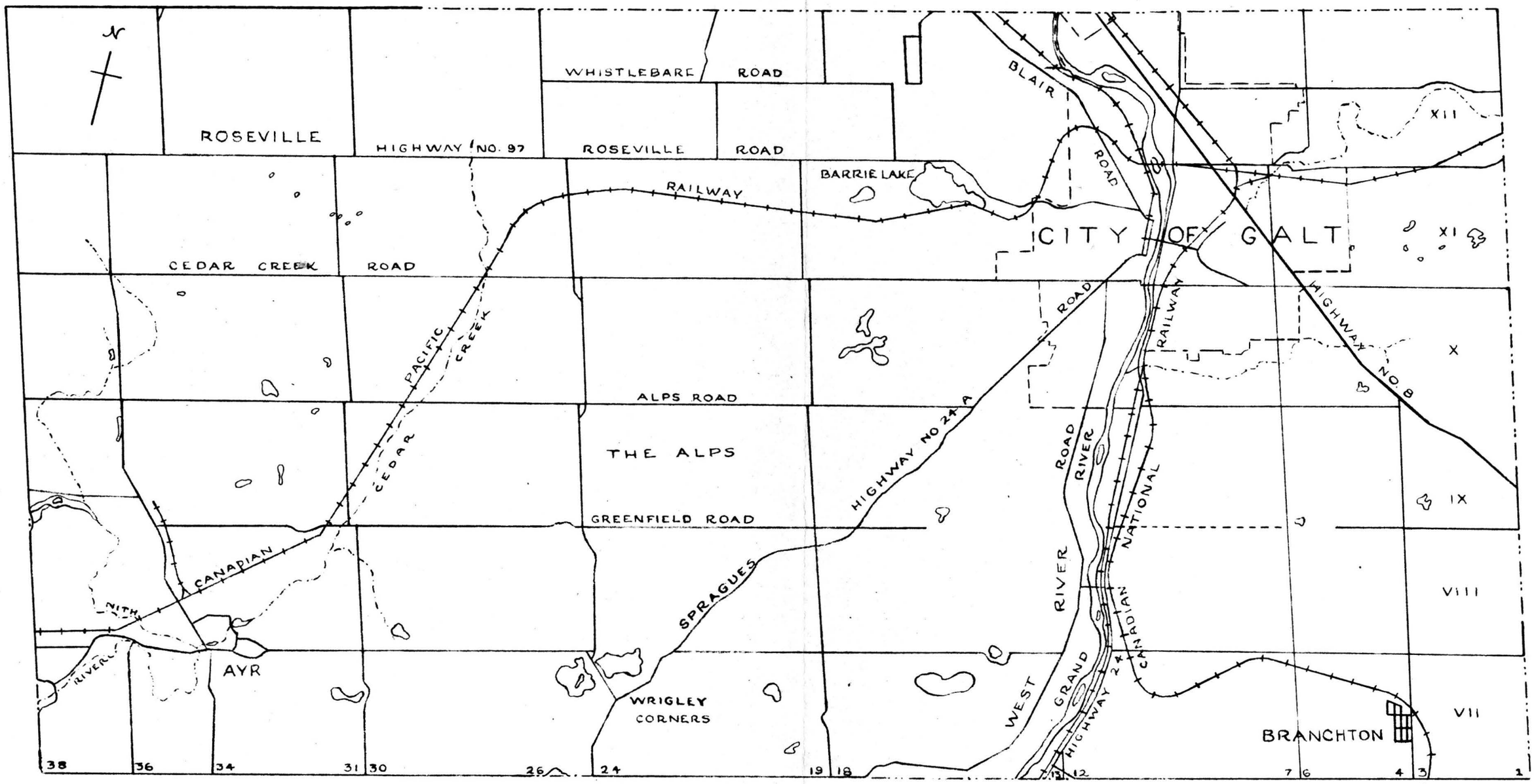
North Dumfries Township is centrally located in Southwestern Ontario. It lies at approximately 43° 20' N. latitude and 80° 20' W. longitude and is the most southerly township of Waterloo County. The Grand River, flowing south through the area, passes through the city of Galt, situated approximately sixty miles south-west of Toronto, twenty-five miles north-west of Hamilton and sixty-three miles east of London. Within twenty miles of Galt are located the centres of Brantford, Paris, Kitchener, Preston, Hespeler and Guelph.

North Dumfries Township is bordered by the townships of Blenheim in Oxford County to the west, Waterloo in Waterloo County to the north, Puslinch in Wellington County to the north-west, Beverly in Wentworth County to the east and South Dumfries in Brant County to the south.

North Dumfries Township is approximately rectangular in shape. It measures 12.1 miles from east to west and 6.2 miles from north to south. Areally, the township, including the city of Galt, comprises approximately 48,013 acres or about 75.02 square miles.

North Dumfries Township has an overall relief of approximately 325' with elevations ranging from 825' in the Grand River Valley to 1150' above sea level in the northwestern section of the township.

Figure 2



BASE MAP OF NORTH DUMFRIES TOWNSHIP

LEGEND

ROAD	——	TOWNSHIP BOUNDARY	—·—·—
PATH	-------	CITY LIMITS	— — —
RAILWAY	——	CONCESSION NUMBER	VII
STREAM	~·~·~	LOT NUMBER	5

SCALE-1 MILE : 1 INCH

FIGURE 2

2. Geology

North Dumfries Township is underlain by sedimentary rocks laid down in the Palaeozoic era of geologic time over ancient Precambrian rocks. The softer Salina shale formation overlying the harder Guelph dolomite has been eroded away over the eastern half of the township. Both these formations dip gently to the south-west. Because of the greater resistance of the dolomites and the upward slope of the rocks, there is a small section of these rocks exposed in the southeastern area of the township. This small section is a part of a large area of exposed bedrock and shallow overburden which extends eastward outside the township, and is known as the Beverly limestone plain.

3. Physiography

The present physiography is due mainly to glaciation which occurred during the Pleistocene geologic epoch, ending about 55,000 years ago. Four glacial ice sheets are thought to have affected this region. However, the last ice sheet, the Wisconsin, which once covered all of Ontario, is responsible for most of the present drift cover. But, a kame moraine found in the northwestern section of the township is thought to have been deposited by one of the former ice sheets and only modified by the Wisconsin sheet.[1]

This kame moraine was probably laid down during a halt in the retreat of an ice sheet. Meltwaters flowing off or out of the glacier deposited,

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1. L.J. Chapman and D.F. Putnam, The Physiography of Southern Ontario, (Toronto, 1951). p. 27.

along the ice front, conical shaped mounds of poorly stratified sand and gravel forming kames.

There are several reasons for thinking that this formation is not associated with the work of the Wisconsin ice sheet. For one thing, there is much more sandy till present than is usual in kame moraine, suggesting later additions of material by a subsequent ice sheet. Also, there is no spillway left by the meltwater stream which deposited the kames, and the topography is less rugged than in other kame moraines suggesting levelling off by the Wisconsin ice sheet.[1] Furthermore, this kame moraine lies nearly perpendicular to the direction of the Paris and Galt moraines and thus cannot be easily fitted into any description of the work of the Wisconsin ice sheet.

The movements of a glacier are considerably influenced by the topography of the underlying bedrock. It naturally will follow the easiest route and this generally lies through the lowlands and around the highlands. This is what occurred during the last ice age in Ontario. Two lobes of the Wisconsin ice sheet, one following the Lake Huron through and the other the depression now occupied by Lake Ontario and Lake Erie, moved southwards and spread out over southern Ontario. The Lake Ontario - Erie lobe covered North Dumfries Township. As the ice sheet melted and retreated over Ontario, the Lake Ontario-Erie lobe retreated eastwards across the township.

As the glacier advanced over the township a cover of heterogeneous till, picked up previously and carried along under the ice was deposited

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1. L.J. Chapman and D.F. Putnam, The Physiography of Southern Ontario, p. 47.

A kame moraine formed of sandy loam and some gravel.

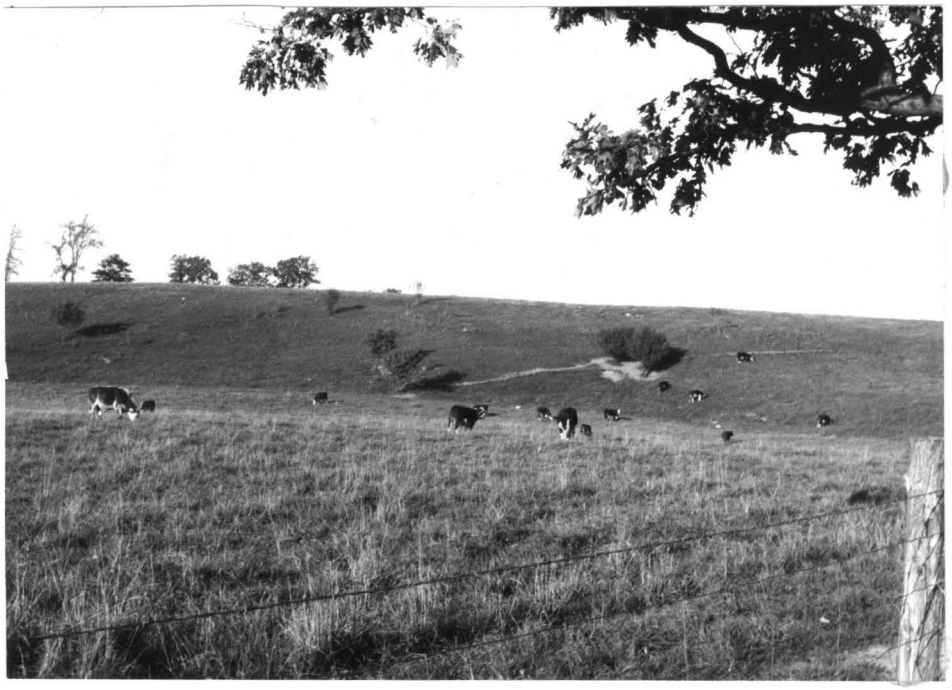
A typical kettle of the outwash plain. Note abundance of willow trees and swampy land.

over much of the area. Overriding by the glacier levelled out the topography and produced a till plain. During the withdrawal of the glacier, morainic deposits were laid down over these areas of till and meltwaters washed some of the till, with the result that now there are only five small deposits of till plain to be seen in the township. One area is adjacent to the kame moraine in the north-west of the township and the others are located between morainic ridges, three west of the Grand River and one east of it.

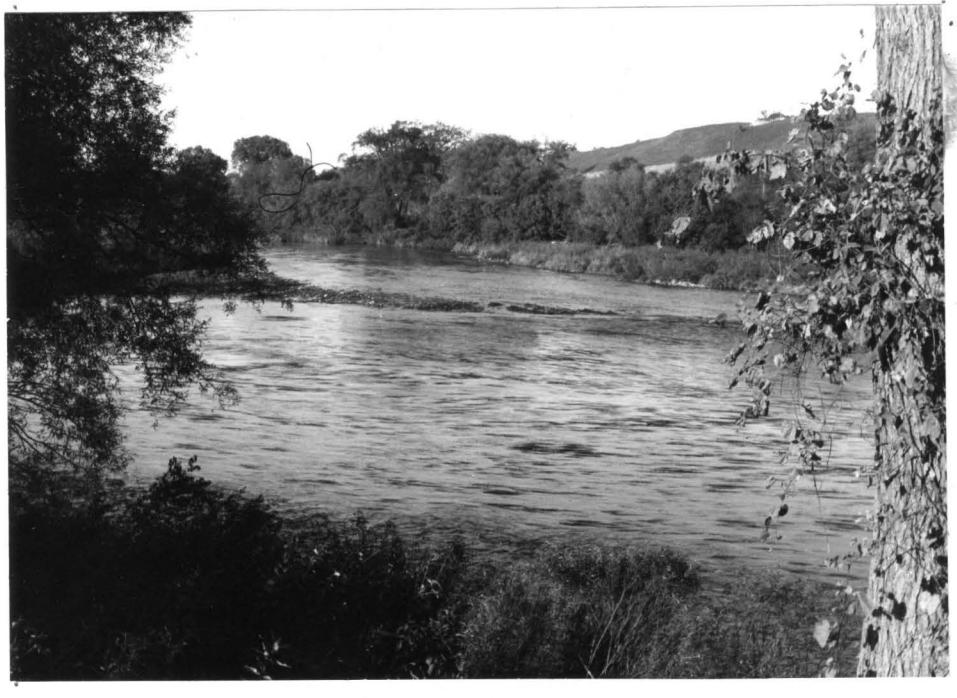
During the retreat of the glacier there were small readvances. It was during two such readvances of the glacier that the Paris and Galt moraines were formed over the till. As the glacier advances it shoves material in front of it which is deposited in a ridge when the glacier halts. Because of the renewed vigour of the glacier there are few melt-streams in front of it and thus there is little outwash found in the moraine. Parallel ridges running north and south to the west of the Grand River form the Paris moraines. The Galt moraine forms a wide band of hummocky hills running northwards to the east of the Grand.

Between the hummocks and knobs of the moraines are many undrained depressions of irregular shape. All of them were probably formed by the filling of depressions in the moraine with rainwater.

As the ice retreated northeastwards meltwaters flowing from the glacier formed a network of streams in North Dumfries Township. The main channels which were the lowest ~~and~~ parts of the Paris and Galt moraines are now occupied by the Grand River, Cedar Creek and the Nith River.



The top of this ridge indicates the highest level of melt-stream activity flowing through the Grand River spillway.



The Grand River south of Galt. The steep valley was cut by a glacial meltstream flowing into Lake Warren.

The Cedar Creek spillway was linked to the Grand across the northern part of the township and again across the southern part because two sections of the Paris moraine, one to the south of the township, and the other within the township blocked the flow of meltwaters causing them to spread out.

Several areas of bog, marsh and water have remained as kettles and kettle lakes. They were created in the outwash of both the spillway and kame moraine by the melting of ice blocks buried in the outwash. These kettles vary greatly in size, some being formed from small single blocks of ice and others from the coalescing of several kettles or depressions. The Roseville Swamp, Barrie Lake, and the area to the south of the Paris moraine form the largest and most concentrated areas of kettles in the township. The kettles of the kame moraine are very small, many of them being small swampy patches in the spring which dry up in late summer.

The sides of the Grand River Valley form two distinct terraces. This is evidence of different levels of meltstream activity. During and immediately after the formation of the Paris and Galt moraines glacial meltwaters flowed south, through North Dumfries and into a large glacial lake known as Lake Whittlesey which occupied the expanded basins of the present Lake Erie and Southern Lake Huron. This lake drained westwards. However, further melting of the ice northward uncovered a lower outlet for the lake, eastwards.[1] The level of Lake Whittlesey dropped

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1. J. Gilluly, A.C. Waters, A.O. Woodford, (Freeman, 1953). p. 316. Principles of Geology

over forty feet, and the lake then formed was known as Lake Warren. Meltstreams flowing into this lake were subsequently forty feet lower, accounting for the forty foot difference in the terraces of the Grand River.

4. Drainage.

The whole township lies within the drainage basin of the Grand River and its tributaries, Cedar Creek and the Nith River. These three streams all flow through glacial spillways and their direction is largely determined by the surface relief as it was moulded by the glacier. They however carry much less water than the streams which cut their valleys.

The Grand River begins 30 miles south of Georgian Bay near Dundalk and flows 180 miles to Lake Erie. In North Dumfries the river flows fairly smoothly through a valley not more than 1/4 mile wide. There are some rapids just below Galt and a small dam just above the Queen St. bridge in Galt formerly used for water power purposes.

Because of denudation of the land for agriculture at the headwaters of the stream the river developed a very high flow in the spring and a low summer, fall and winter flow. In the spring drastic floods occurred in North Dumfries Township, but due to the formation of the Grand River Valley Conservation Authority, the building of the Shand and Conestoga Dams to control stream flow and the beginning of several reforestation areas, the reduction of flooding has been considerable.

Mill Creek has now been channelled under the city until it enters the Grand below the Main St. bridge.

The Nith River wanders southwards till it meets the Grand at Paris. Its valley is narrow within the township and considerable down cutting is still going on.

Roseville Swamp lies in a glacial spillway. It feeds water into Cedar Creek which flows sluggishly southward entering the Nith River at Ayr.

The many small lakes and ponds in the township have no outlets. They are either kettles or undrained depressions in the moraine.

4. Climate.

Climate affects the soil, natural vegetation and agricultural activities of a region, which in turn strongly influence the economic activities of that region.

There are two chief factors which control the climate of North Dumfries Township. It is situated in the path of the prevailing westerly winds and the zone of cyclonic storms which tend to create a variable type of weather. The proximity of the township to the Great Lakes, which have an ameliorating and stabilizing influence on the climate, is also an important factor.

Galt has a climatic station but it has not been in existence long enough to release accurate statistical averages. Thus, information released by the climatic stations at Guelph, Kitchener, Paris and Brantford all located just outside the township, has been used in the following resumé of the climate of North Dumfries Township.

The mean annual temperature of North Dumfries Township is 45° F. with a maximum monthly mean of 69° in July and a minimum monthly mean of 19° in

February. December, January, February and March have average temperatures below 32°F. Fall temperatures average around 48° while the spring averages 42°.

From these figures it appears that Galt receives some ameliorating influence from Lake Ontario and Lake Erie. Summers are not very hot, nor are winters particularly cold. By comparing Galt's yearly temperature variation with that of a station such as Ottawa which is located away from the Great Lakes the effect of the lakes can be clearly seen. The difference between maximum and minimum monthly mean temperatures in Galt is 49°, in Ottawa 59°.

Two other ways in which temperature influences agriculture are in the length of the frost free period and the growing season. In North Dumfries the last frost occurs around May 14th and the first fall frost about Oct. 2nd, resulting in a frost free period of approximately 141 days. The beginning and the termination of the growing season is determined by observing the average date of occurrence in the spring and fall of a mean daily temperature of 42°F.[1] This temperature occurs around April 11th in North Dumfries and again around Nov. 1st, resulting in an average growing season of about 210 - 217 days. This is about 73 days longer than the frost free period.

The mean annual precipitation is 30.2", and it is fairly uniformly distributed throughout the year with the maximum occurring in the late spring and summer months, mostly during cyclonic storms. The precipitation in the winter months chiefly falls as snow. The area receives approximately 57 inches of snow from November to April, the largest percentage

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1. L.J. Chapman and D.F. Putnam, The Climate of Southern Ontario, (Scientific Agriculture; 18,8 April 1938). p. 419.

occurring in January and February. There are on the average approximately 120 rainy or snowy days a year.[1]

From the above data it would seem that the amount and distribution of rainfall is satisfactory for general farm crops. The weather is usually sunny and dry during the harvesting season and the growing season is long enough so that a wide range of crops can be grown.

According to Chapman and Putnam's "Climatic Classification of Southern Ontario"[2] North Dumfries Township is included in the climatic region of the "South Slopes". This refers to a belt of country north of Lake Erie and Lake Ontario, transitional between the area receiving maximum influence from the Great Lakes and the cooler climates to the north.

In order to determine whether a climate is actually moist or dry C.W. Thornthwaite has devised a quantitative classification involving the effectiveness and distribution of precipitation and the efficiency of the temperature. Thornthwaite says that "we must know whether precipitation is greater or less than the water needed for evaporation and transpiration".[3]

The amount of water available in the soil at any one time affects the soil forming processes which are important in the development of the land for agriculture. Thus Thornthwaite's method indicating soil moisture deficiency or surplus is important.

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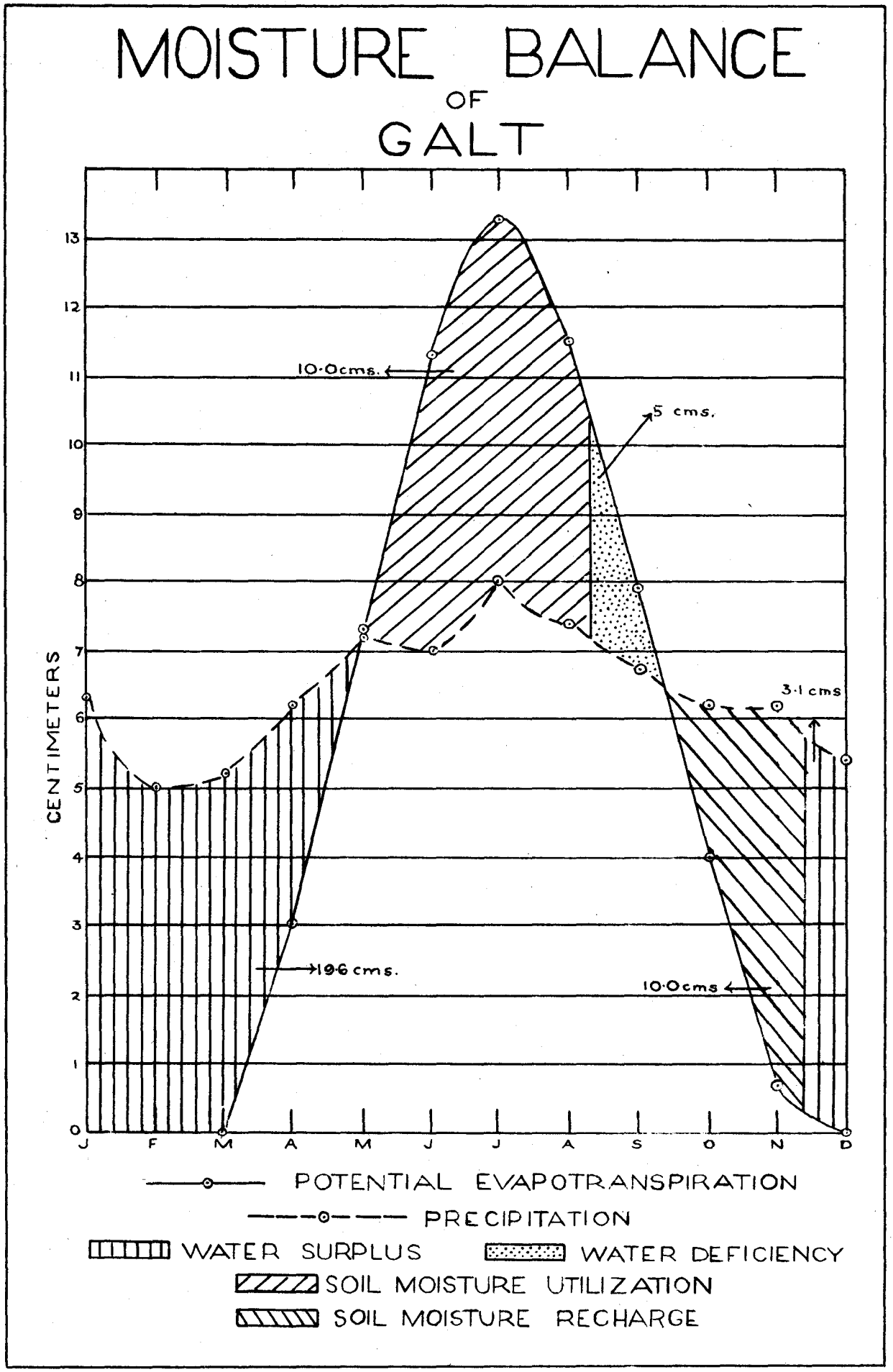
1. L.J. Chapman and D.F. Putnam, The Climate of Southern Ontario, (Scientific Agriculture; 18,8, April 1938). p. 429.
2. L.J. Chapman and D.F. Putnam, The Climate of Southern Ontario, (Scientific Agriculture; 18,8, April 1938). p. 438.
3. C.W. Thornthwaite, An Approach toward a Rational Classification of Climate, (The Geo. Review, Vol. XXXVIII, No. 1, [illegible], 1948). p. 55.


MOISTURE BALANCE
OF
GALT
CENTIMETERS
0
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5 cms.
3·1 cms
19·6 cms.
10·0cms
POTENTIAL EVAPOTRANSPIRATION
PRECIPITATION
WATER SURPLUS
WATER DEFICIENCY
SOIL MOISTURE UTILIZATION
SOIL MOISTURE RECHARGE

FIGURE 3

Using Thornthwaite's method of climatic classification the climate of North Dumfries Township is termed a Humid Mesothermal climate with little water deficiency.

The transport of water from the soil and plants back into the atmosphere is called "evapotranspiration". Thus potential evapotranspiration represents the possible evapotranspiration under "ideal conditions of soil moisture and vegetation".[1] Both temperature and latitude are taken into consideration in calculating the P.E. for a region. North Dumfries Township has a P.E. of 59.0 inches.

Although the yearly precipitation of North Dumfries Township is 76.68 inches[2] this does not mean that there is always sufficient water on hand, for much of the precipitation occurs when the P.E. is low, i.e. during the winter months. When the P.E. is less than precipitation the soil can retain moisture only up to field capacity assumed to be 10 centimeters. Any precipitation over 10 centimeters is lost by evaporation and runoff. During October, November, December, January, February and March the P.E. is less than the precipitation in North Dumfries.

During the months of April, May, June, July, August and September the P.E. is greater than the precipitation. To meet the required water need in April, May, June and July the 10 centimeters of soil moisture in storage is relied upon. When this reservoir has been used, which occurs

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1. C.W. Thornthwaite, op. cit, p. 56.
2. Precipitation Statistics, Department of Transport, Toronto.

some time in August in the Township, and since the P.E. is still greater than the precipitation there occurs a water deficiency which in North Dumfries Township reaches an average total of 5.0 centimeters.[1] However this is not great enough to be felt to much extent in the average year in this humid region. A slightly lower crop yield than would be possible without this deficiency is the main result.

6. Natural Vegetation.

Climate, soils and relief have considerable influence on the climax vegetation of a region. On the other hand, once this natural vegetation has been established it has considerable influence on further soil forming processes.

W.E.D. Halliday in his "Forest Classification of Canada" has taken into consideration both the climate and a common association of trees in determining his forest regions. According to Halliday, North Dumfries lies along the border between two regions. The northwestern half of the Township belongs in the Huron Ontario Section of the Great Lakes - St. Lawrence Forest Region. The southeastern half is included in the Niagara section of the Deciduous Forest Region.

A mixed forest characterizes both regions although the prevailing association is broad-leaved with sugar maple and beech comprising three quarters of the forest. With them are basswood, red oak, white oak, bur oak, red maple, small groups of hemlock and an occasional white pine.

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1. See Appendix A for Thornthwaite Tables.

Scattered large-toothed aspen, bitternut hickory, butternut, blue beech and silver maple prefer moist soils and often locate on the banks of streams or in swamps. Black walnut, sycamore and black oak are found throughout the township, red juniper is found on gravelly sites and eastern white cedar in swampy depressions.[1]

In the Niagara section alone many species of southern trees and shrubs are common. Here, many reach their northern limit or have their major Canadian distribution. The chestnut oak, the chinquapin oak, the pignut hickory and the rock elm are found on dry rocky soils. Sassafras prefers sandy soils and rich loams and is found along the Grand River in North Dumfries. Other trees found in the Niagara section in the township are mockernut hickory, black gum, papaw, shagbark hickory and scarlet oak.[2]

In the Huron-Ontario section are found species which do not appear in the Niagara section. White elm, yellow birch, white ash, balsam fir, iron wood, slippery elmand black ash are all common to the north-west half of the township.[3]

Actually, the line drawn between the two regions is hypothetical. A change occurs in this area, but it is transitional. Thus, scattered trees characteristic of one section may be found in the other.

Also, most of the township, today, has been cleared of its natural vegetation. Therefore, the number of trees of most of the species mentioned by Halliday is limited. From observation it appears the most common trees seem to be maple, beech, elm, white cedar and willow. The latter tree appears

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1. W.E.D. Halliday, A Forest Classification of Canada, (Ottawa 1937).
2. Ibid.
3. Ibid.

A reforestation area planted in spruce, part of the Waterloo National Forest.

The maple - beech association seen on very poorly drained land.

quite frequently on stream banks and surrounding the numerous kettle lakes but is not mentioned by Halliday in his classification.

Most of the natural vegetation in the township appears only on the hilliest and wettest areas. Areas of swampy kettles such as the Roseville Swamp and Wrigley Corners as well as areas of morainic depressions such as that west of Branchton are still under or surrounded by forest cover. West of the Grand River along the Alps Road is an area of rugged morainic topography, too steep for agriculture, which is still under forest cover. Other steep areas on the moraine as well as the sides of the Grand River Valley have also remained under forest cover.

7. Soils.

The formation of soil depends on such factors as the nature of the parent material, underlying bedrock, climate, plant and animal life, relief and drainage, and the length of time these factors have acted on the material. During the process of formation different layers or horizons develop in the soil.

The soils of North Dumfries Township belong in either the Grey-Brown Podzolic or the Dark Grey Gleisolic Great Soil Group, the former group being the most common.

In North Dumfries, the Grey-Brown Podzolic soils have developed on glacial deposits of calcareous materials. These soils are characterized by a leached horizon and a horizon of accumulation.

The dark grey Gleisolic soils have developed under poor drainage conditions and generally do not have a marked leached layer or layer of accumulation.

SOILS IN NORTH DUMFRIES TOWNSHIP

SCALE 2 MILES : 1 INCH

WELL DRAINED

- BURFORD LOAM
- DUMFRIES LOAM
- GUELPH LOAM
- WATERLOO SANDY LOAM

IMPERFECTLY DRAINED

- LONDON LOAM
- FARMINGTON LOAM

POORLY DRAINED

- MUCK, BOTTOMLAND
- BROOKSTON CLAY LOAM

FIGURE 4

In North Dumfries, within these two great soil groups the soil texture ranges from sandy loams to clay loams. Drainage ranges from poorly drained to well drained conditions and relief ranges from flat to steep and hilly.

The Bog soils are formed under very poorly drained conditions. They consist of organic accumulations and frequently occupy depressional areas which receive considerable seepage. The well decomposed Bog soils found in the township are referred to as Muck soils.

Recently deposited alluvial materials occur on low-lying land along stream courses subject to occasional flooding and which have not as yet had sufficient time to develop a profile.

The classification of soils into soil types is made on the basis of similar parent materials, texture, drainage and relief. The following discussion on the main soil types of North Dumfries is based on material collected by the Ontario Agricultural College Soils Department. As there is no soil report of Waterloo County the profiles mentioned were taken from other county records which listed the same soil type. There may be a slight difference in profiles between areas.

1. Waterloo Sandy Loam Type.

These soils have developed on poorly sorted sandy outwash materials, under a deciduous forest vegetation. In North Dumfries they are found in the northwestern section of the township. The layers of sand and gravel permit good internal drainage. Droughtiness, low fertility and low organic matter content limit crop production. The soil, however, responds to

nitrogen, potash and phosphate fertilization. There is some problem with erosion but slopes are not very steep.

The following is a profile description of Waterloo sandy loam.

A_o - Accumulated layer of partially decomposed litter from deciduous trees.

A_1 - 0 - 4 inches, dark brown sandy loam which is slightly stony.

A_{21} - 4 - 14 inches of light, yellowish brown sandy loam which is stonefree.

A_{22} - 14 - 16 inches of pale brown sandy loam which is stonefree.

B - 16 - 25 inches of brown loam with few stones.

C - light grey, stonefree, calcareous parent material.[1]

2/ Dumfries Loam Type

These light textured limestone till soils are developed on coarse open materials derived largely from dolomitic limestone. Natural drainage is good due to the loose texture of the soil although erosion is severe owing to a rugged topography which permits very rapid runoff. An excessive number of stones and a low amount of organic matter and phosphate makes cultivation difficult. Dumfries loam is the largest mapped soil type in the township and is the characteristic soil of the Paris and Galt moraine.

The following is a generalized profile description of Dumfries loam.

A_o - A thin layer of partially decomposed leaves and woody material.

A - 0 - 4 inches of dark brown loam with a few large stones.

A_{21} - 4 - 9 inches of yellowish brown loam, moderately stony.

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1. Soil Survey of Perth County, Guelph 1952. p. 44.

Dumfries Loam soil is characteristic of the till moraine.
Note angular stones.

Burford Loam soil is characteristic of the outwash plain.
Note the rounded stones and level terrain.

A_{22} - 9 - 11 inches of pale brown sandy loam with occasional stones.

B_2 - 11 - 18 inches of yellowish brown loam which is very stony.

C - Light yellow-brown sandy loam, very stony and bouldery, calcareous parent material.[1]

The stones throughout the profile are angular or slightly rounded and vary in amount.

3. London Loam Type

Small sections of London loam type are located mostly among the Dumfries loam type in North Dumfries. The topography is smooth to gently sloping and erosion is slight, but the natural drainage is imperfect because of low runoff, and slow internal drainage.

A brief description of the profile follows:-

A_o - Accumulated layer of partially decomposed litter from deciduous trees.

A - 0 - 5 inches of dark greyish brown loam with few stones.

A_2 - 5 - 9 inches of yellowish brown loam, mottled, with few to frequent stones.

B - 9 - 12 inches of brown clay loam, mottled, with few to frequent stones.

C - Light grey loam till composed chiefly of dolomitic limestone, mottled, moderately stony.

In some cases the A_2 and B horizons are so poorly defined that it is difficult to distinguish them.

4. Guelph Loam Type

These soils have developed on a medium textured limestone till. They are inherently low in phosphate and are only moderately well supplied with organic matter and potash.

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1. Soil Survey of Perth County, (Guelph, 1952.) p. 34.

This is the characteristic soil of the five areas mapped as till plain.

The following is a description of the profile.

A_o - Accumulated layer of partially decomposed litter from deciduous trees.

A - 0 - 4 inches dark greyish brown loam,which is slightly stony.

A_{21} - 4 - 12 inches pale brown loam, which is slightly stony.

A_{22} - 12 - 14 inches grey loam,which is stonefree.

B - 14 - 24 inches brown clay loam with few to frequent stones.

C - Light grey loam till, moderately stony, boulders varying from few to frequent.[1]

5. Burford Loam Type

These soils consist of well-sorted gravelly materials developed on outwash. Drainage is good and the organic matter content is medium although the levels of phosphorous and potassium are low. This is the characteristic soil of the glacial spillways.

The following is a generalized profile description.

A_o - Accumulated layer of partially decomposed litter from deciduous trees.

A - 0 - 6 inches very dark grey-brown gravelly loam with few stones.

A_{21} - 6 - 17 inches yellowish brown slightly gravelly loam;

A_{22} - 17 - 19 inches light yellowish brown loam.

B - 19 - 30 inches dark brown clay loam; gravelly.

C - Grey,well sorted gravelly and cobbly material.[2]

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1. Soil Survey of Perth County,(Guelph, 1952.) p. 33.
2. Soil Survey of Perth County,(Guelph, 1952.) p. 33.

6. Farmington Loam

~~The~~ Farmington loam is a shallow soil derived from a thin layer of till and some weathered limestone. It occupies a small area in the south-west of the township. For the most part drainage here is excessive. The profile is less than a foot in depth and soil horizons are only weakly differentiated.

The following is a description of the profile: 2 - 3 inches of dark brown loam underlain by 2 - 6 inches of grey brown stony loam grading into 1 - 2 inches of dark brown clay loam over limestone bedrock.[1]

7. Brookston Clay Loam Type

This is the only soil type mapped in the township belonging to the Dark Grey Gleisolic Soil Group. It is found in a small section in the south-east of the township. This developed on heavy textured subaqueous limestone till. Although the soil is inherently fertile, poor drainage is a definite limiting factor to agriculture.

The following is a generalized profile description of Brookston clay loam.

A_o - Accumulated layer of partially decomposed litter from deciduous and a few coniferous trees.

A - 0 - 7 inches black clay loam; stonefree.

C - 7 - 11 inches grey-brown clay loam mottlings increase with depth; stonefree.

C - Pale brown clay; mottled; few to frequent stones.[2]

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1. Soil Survey of Prince Edward County,(Guelph, 1948). p. 53.
2. Soil Survey of Perth County,(Guelph 1952). p. 31.

8. Bog Soils

These soils are found in many scattered poorly drained depressions. In North Dumfries the muck soils consist of black decomposed woody material of varying depths,over sand.

9. Alluvial Soils

The land lying along stream courses which is subject to flooding is designated as Bottom Land. The soil is usually made up of successive layers of silt, sand and clay intermixed with layers of organic matter. There is very little horizon differentiation.

8. Land Types.

Soil type areas, as seen on the soil map, appear to correspond to areas of similar physiographic characteristics. The unit formed, is known as a land type. There are six land type regions in North Dumfries Township.

1. Kame Moraine

This land type occurs over 11.4 per cent of the total township area. It is characterized by an irregular hummocky appearance, dotted occasionally with small kettles. The soils, developed on the poorly sorted sandy outwash which formed the kames, are of the Waterloo Sandy Loam type.

2. Till Moraine

This land type, found over 40 per cent of the township, is the largest mapped type. It is characterized by a hilly relief with many small swamps and ponds, formed in depressions between the moraine. The soils, developed on stony till materials, are of the Dumfries Loam type. In some of the poorly drained depressions London Loam type has developed.

LAND TYPES OF NORTH DUMFRIES TOWNSHIP

SCALE 2 MILES : 1 INCH

KAME MORAINE

TILL MORAINE

OUTWASH PLAIN
LOCALLY DISSECTED

TILL PLAIN

LIMESTONE PLAIN

MUCK & SWAMPLAND

FIGURE 5

3. Till Plain

This land type occupies 19.5 per cent of the township and is characterized by a smooth and gently rolling topography. The soils, developed on stony till laid down as ground moraine are of the Guelph Loam type.

4. Outwash Plain

This land type occupies 23.6 per cent of the township and forms smooth to rolling landscape, interspersed with many kettles. The soils, developed on sand and gravel outwash materials, are of the Burford Loam type.

5. Limestone Plain

This land type occupies 2 per cent of the township, is located in a small section in the southwestern part of the township and is characterized by a shallow overburden. The soils, developed on this, are of the Farmington Loam type.

6. Muck and Swamp land

This land type occupies about 3.5 per cent of the township, being found in many, scattered poorly drained depressions, which are either kettles or depressions in the moraine. Two soil types, Brookston Clay Loam type and Muck Type are found here. The Brookston Clay Loam is not as poorly drained as the Muck Soil Type and some profile has emerged.

CHAPTER II

HISTORICAL GEOGRAPHY

The historical geography of North Dumfries is discussed in three divisions. The first deals with the Indian period (1817) while the second is a discussion of early European settlement in the township (1817 - 1861). The date 1861 was chosen as a division point because it was the date of maximum population in the township. After this time certain important changes brought a decline in population. The third section deals with these changes and the resultant development of a mixed farming economy (1861 - 1941). The study of the years after 1941 are included in Chapters III and IV.

1. Indian Period (- 1817)

Before the coming of the white man, North Dumfries Township was an Indian hunting ground. The area was first claimed by an Algonquin tribe but they were replaced by the Neutrals about four hundred years ago. In 1650, however, the Neutrals were destroyed by the Iroquois, and by 1750 the land had been returned to an Algonquin tribe, this time the Mississaugas. From these Indians, England purchased,in 1783,a strip of land extending six miles on each side of the Grand River from its mouth to its source, a strip which included North Dumfries Township. It was then given to Chief Joseph Brant and the Six Nations Indians as a reward for their loyalty during the American Revolution. For several decades this territory was the principal hunting grounds of the Six Nations. Often small bands of Indians camped along the Grand, especially

along an old trail on the east side of the river. However, the increasing demand for land attracted speculators, and so the northern sections were sold by the Indians. In 1798, Block I containing 94,305 acres, which now composes North and South Dumfries, was sold to one Philip Stedman of Niagara. The property was sold twice more before it was purchased in 1816 by William Dickson for £24,000 or a little over a dollar per acre.

The previous owners had little interest in settling the land, but Dickson had in mind bringing out his fellow Scotsmen from his home village of Dumfries in Scotland and founding a new settlement to be known as Dumfries.

At this time, the only inhabitants of the township were two or three squatters' families who grew a little corn and hunted in the forest. The only settlement in the neighborhood of Dumfries at this early period was Doon in the adjoining township of Waterloo. The entire land was an unbroken forest of huge oaks, maples and beeches intermingled with some pines and elms. Cedars predominated on the wetter, swampy ground. Here grew the climax vegetation spoken of by Holliday in his "Forest Classification of Canada".

Dickson chose one Absalom Shade to assist him in founding his colony. After visiting the area, they settled on the present site of the city of Galt, located at the point where Mill Creek joins the Grand River. There was a sufficient fall of water at the mouth of Mill Creek for water power, the main factor in choosing this site for the village. Shade was given

the task of building a grist mill, a flour mill and a store, all basic necessities in carving a colony out of the wilderness. This settlement was to be the nuclei around which an agricultural community was to develop. On the site was already an old grist mill which a squatter had built a few years before and then abandoned. Shade patched up the old mill and used it to grind the first corn.

2. Early Settlement (1817 - 1861)

Dumfries, which includes both North and South Dumfries, became a township in the County of Halton, District of Gore in 1817.

In the same year the township was surveyed into lots and concessions. Concessions VII to XII became North Dumfries when Dumfries was divided in 1852. The land, three lots in width on both sides of the Grand River, was divided into sections running east and west, for accessibility purposes. Two of the earliest trails in the township ran along the banks of the Grand.

In the spring of 1817 a saw mill was built in the Mill Creek settlement, then known as Shade's Mills and by 1819 a flour mill had been buikt. The first bridge spanned the Grand in 1819 at the site of the present Main St. bridge. This linked the settlement with Indian trails on the west side of the river and opened the northwestern section of the township to settlers.

The first to purchase property in the township were three Scots who migrated from Genesee, N.Y. and settled in North Dumfries, between Galt and Branchton. Here, although close to Galt, these men were nevertheless able to form their own farming community for themselves and their friends.

By 1822 there were about ten landowners located in the Roseville area on some of the best land in the township. This settlement began on loam

soils of the flat to undulating till plain.

The first settlement in the Ayr region occurred in 1824 when a joint flour and saw mill was built at the junction of the Nith River and Cedar Creek, making use of a fall of water at this point. Then, and for many years afterwards, rafts, carrying lumber and flour were floated down the Nith to the Grand River at Paris and then on to Dunnville.

However, during the first decade (1817 - 1826) the settlement of Dumfries proceeded slowly. There were many difficulties to surmount for as yet there were no roads into the area. Settlers had to follow old Indian trails. The nearest stores were in Ancaster and Dundas, twenty miles away, with the formidable Beverly swamp between them and Dumfries. Much of the area was hilly, stony and dotted with swamps and lakes. Before the land could be tilled dense forest had to be cleared.

From 1820 to 1840 there was little thought given to conserving the forests. Hundreds of trees were felled and burned recklessly. Because the area did not contain great quantities of pine but instead was covered with hardwoods of limited value, lumbering never played a very prominent part in the settlement of this township. Some saw and grist mills were built but not to the extent of other areas where a more valuable coniferous forest growth was dominant. The long distance from markets was another influential factor hindering development of this industry, although records show that a considerable amount of square timber was taken out. Early saw and grist mills were located on the Nith, on Cedar Creek and on the Grand at Galt where water power facilities were available.

Dickson soon began advertising in Scotland to encourage his fellow countrymen to come and settle in Dumfries, in spite of the difficulties. From 1826 onwards, a steady stream of Scottish immigrants, mostly hardy shepherd folk, reached the township. With few taking more than axes, they set out to clear a little land to grow a few acres of wheat and erect homes, usually of unhewn logs chinked with clay.

Gradually, roads were being built. It was in 1827 that a road linked Galt, as it now was called, to the newly founded village of Guelph. This proved to be a boon to Dumfries because it linked the township to a road just built from Guelph to Hamilton. Another road following an old Indian trail along the east side of the Grand River from Paris to Galt was also built in 1827. These two roads made Galt more accessible for settlers. In the 1830's, a road from Galt to Dundas was opened through the Beverly Swamp. It was then known as the Dutch Trail but now as Highway #8. However, travel on this road was dangerous and treacherous and many people disappeared, after having lost the trail in the midst of the swamp. Thus, in 1837, a new macadamized road, laid over the old Dutch Trail, was opened. This greatly enhanced the prosperity of the entire district ~~for~~ as this road now provided for Galt a quick direct route to Hamilton and world markets. Grain and other produce could be transported more easily out of the township and manufactured goods brought in.

For the most part a grid pattern of roads was used when the township was surveyed. A strip of one chain, sixty-six feet in width between

each concession was designated as a road, and a road allowance was held between every six lots. In most cases this road pattern was kept when these roads were opened in the 1830's as the settlers arrived. However, there were two factors which presented difficulties to a grid pattern of roads in this township. Several areas of rugged terrain required some very steep roads to be built. Numerous lakes scattered throughout the township required, in some instances, that the roads be built around them. Stanley Street, the main street running east and west through Ayr, was built in return for the original road allowance between Concessions VII and VIII, because it was too swampy. In other cases, however, the roads were built over these swampy sections, causing frequent difficulties in the years to follow.

The Grand River, because it is quite shallow in certain areas and there are rapids just below Galt, has never been of much use as a means of transportation to North Dumfries. In the early days, however, some logs were floated down it. In the 1830's, after the opening of the Welland Canal an attempt was made to send grain down the Grand to Lake Erie and thence through the Canal. Although for two years this hazardous trip was successful, the third year some of the barges were grounded. This incident closed this transportation route and henceforth all products were transported overland.

Between 1834 and 1837 there were more signs of rapid growth and prosperity. By 1835 most of the land in the immediate neighborhood of Galt was taken up and much of it was cleared and cultivated. The till and

outwash plains around Galt were fairly flat and quite fertile before erosion and soil depletion occurred.

Ontario, at this time, was experiencing a rapid change from an agricultural community to one where industry was becoming increasingly important. Galt, because of her superior water power facilities was among the first localities to experience this boom. It was at this time that a new dam and canal were built on Mill Creek, giving Galt the best water power facilities in the area. Also, until 1834 business was almost exclusively controlled by Dickson and Shade. It was impossible for others to obtain ownership rights on stores up to this time. However, by 1837, these two men had given up their control of the community and thus the way was open for the growth of a prosperous industrial as well as agricultural community.

The first foundry in Galt was built in 1842. This was soon followed by another, in order to serve the needs of this growing community. These industries made anything that was required, including flour milling machinery. Soon, they were making textile machinery also, because it was in the early 1840's that Galt's first textile factory, a woollen mill, was built. It was soon followed by other textile mills, also taking advantage of the excellent water power facilities. Woollen mills were the first established because wool could be supplied by the local farmers.

Galt, as the largest settlement in the township was chosen as the seat of the first township hall which was built in 1838 on the site of the present city hall of Galt. Galt, although situated in the north-west

of the township had always been the main urban centre of development. Now, with its expanding industrial possibilities it was even more the ideal administrative centre for the township.

Meanwhile, agricultural progress was proceeding apace. From the beginning, it was an important factor to settlement. By 1851 - 2 there was a total of 342 farms occupying 40,489 acres or over 90% of the township. Sixty-five percent of this land was under cultivation (see Appendix E). Population in the township increased steadily to a high of 4161 persons in 1861. Thus, in just over thirty years this wilderness was cleared and settled. The success of the township, however, resulted mainly from the growing markets for grain and the fact that other, better agricultural regions were unable to supply all the markets. Some of the land that was being cultivated at this time was really too steep, too wet or too stony for good yields.

Field crop statistics are not available before 1851. At that date, the census reports a yearly crop of 6,592 acres of wheat, 161 acres of barley, 1,816 acres of oats, 107 acres of rye and 477 acres of peas. The demand for wheat as an export commodity during the first half of the nineteenth century was the reason for wheat being the predominating crop.

Potatoes and turnips were also grown at this time in large acreages, the former being sold commercially to Ontario markets, the latter as feed for livestock.

Although, at this time, grain crops predominated, some milch cows, sheep and swine were kept to supply local markets. Sheep were the

dominant type of livestock during this period because the wool was being used in the local woollen mills. The hills, too steep for cultivated crops, provided excellent grazing lands.

Before 1852, such hand implements as ploughs, harrows, rakes, forks, scythes, sickles, grain cradles and sieves were in use. However, 1852 brought the first thresher to the township. Between 1850 and 1860 the grain cradles were replaced by horse-drawn reapers.

There were horses in the township by 1830, but most of the pioneers used oxen to plough their fields. By 1851, there were still 1066 oxen to 1156 horses. By 1861, however, with more horses available, the ratio had changed. Oxen were reduced to 254 and horses now numbered 1543. (See Appendix D).

Several small local centres were founded during these years, mostly as millsites. Jedburgh was established on Cedar Creek just north-east of its junction with The Nith. In 1832, a distillery and a flour mill were established here. Later, another distillery, a woollen mill, two saw mills, a store and a blacksmith shop were built. Another flour mill was built on the Nith just north of the junction with Cedar Creek. In 1840, these two millsites united with an older flour millsite, at the junction of the two rivers, to form Ayr, which soon became known for its flour milling. Much of the local grain was ground here in Ayr and then was sent either down the Nith to Paris, or by road through Galt to Hamilton for distribution. In 1848, the first foundry was established in Ayr and soon began to manufacture farm machinery. The need was so great that the company grew and prospered.

Water power, being the principal reason for the growth of a community on this site, was used by the flour mills, saw mills, foundry and some of the other small enterprises.

Galt, also, benefited greatly from the agricultural success of the area. Much of the wheat grown as far west as Stratford was, then, either sold in Galt or sent through the village as flour on its way down the macadamized road to Dundas. By 1850, Galt had a population of 2,248 and was then incorporated as a village.

The 1850's brought the railway to this part of Ontario. In 1852, the Great Western Railway was built, but it by-passed Galt and went through Paris. Galt had to be satisfied with a branch line built in 1854. However, this factor alone did not hinder Galt's progress. Indeed, the years between 1850 and 1860 can be looked on as the most prosperous period in the past history of Galt. Flour mills, foundries, woollen mills, and furniture factories all prospered. It was during this period that it became known as The "Manchester of Canada". Galt's industries were becoming known for their excellent craftsmanship. The Crimean War of 1854,which caused prices to increase, gave Galt an added impetus. By 1857, the town had two schools and two banks. (See Appendix F for the list of industries 1857).

Eighteen hundred and fifty-nine brought the founding of the Goldie and McCulloch foundry and the Turnbull Knitting mill, both still in existence today. Coal was brought by rail for the foundry, but the knitting mill used water power. Robert Turnbull was a pioneer in the knitting business in Galt. He owned the first sewing machine ever brought there. By 1860, all the wool was imported, but because the articles were so excellently made, the knitting mills prospered.

By 1860, the Grand Grunk Railway was built to the north of Galt, passing through Guelph. Again, Galt received a branch line. Now by-passed by the two railways, she was forced to moderate some of her ambitions. Population continued to increase, but the rise was slow although steady. Until 1945, the rate of increase had been much the same through the years.

The Great Western Railway was responsible for the founding of the village of Branchton. When the branch line was built from Harrisburg to Galt, a station was established at the present location of this village. At this time, the closest hamlet was one-half mile south of the station where a school and blacksmith shop were located. The plan for Branchton was laid out in 1856 and a post office, a flour mill, and a grain warehouse were built soon after. A sawmill near the village already was in existence.

3. Development of a Mixed Farming Economy (1861 - 1941)

North Dumfries Township reached its maximum population in 1861. The period from 1861 to 1941 was a period of adjustment which resulted in the development of a mixed farming economy dominated by a dairy and beef cattle industry. Changes which occurred during this period are discussed below.

Population in the township declined slowly from 4161 in 1861 to 2095 persons in 1911. The sudden drop in population between 1881 and 1891, seen on the chart, is due mostly to the incorporation of the village of Ayr with a population of 1000 in 1884, thus taking this source off the township records.

One of the main reasons for this decline of population appears to have been the development of mechanization. The binder appeared in the township

POPULATION TRENDS
IN
NORTH DUMFRIES TOWNSHIP
1851-1951

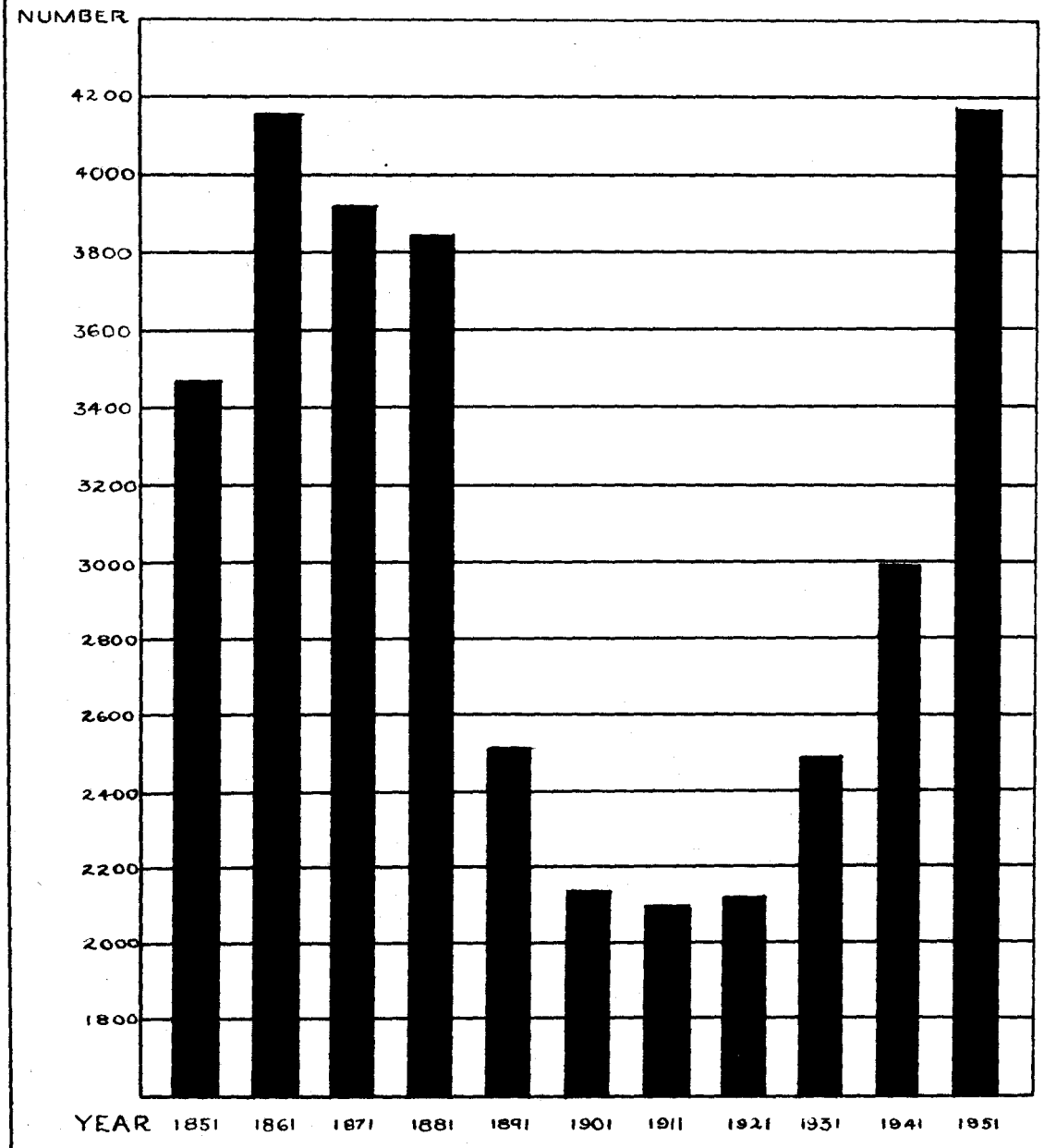

FIGURE 6

in 1880. From 1861 on, the farms became larger and less and less man-power was needed to work the land, with the result that many persons migrated to the growing industrial cities.

The building of the railways north and south of the township in the 1850's was a minor cause of population decline. The area was only slightly inconvenienced as far as shipping flour and other products were concerned.

With most of the land cleared for agriculture, several sawmills and other wood-using industries, prosperous at the beginning of this period, were forced to close. Sawmills existing in Branchton, Ayr, Roseville and Reidsville in the 1870's closed soon after the turn of the century. In 1870 there was a shingle mill, a cabinet factory and a waggon shop in the now extinct Black Horse Corners south of Roseville, a match factory in Branchton, and a shingle and a waggon factory in Roseville. These gradually closed, along with the sawmills, when there was no longer enough timber available. This was the main cause of the disappearance of the settlement at Black Horse Corners.

With a decline in the growth of wheat after 1900, when Ontario lost its grain markets to the West, many of the flour mills closed. This struck a blow to Ayr's prosperity for she had become a fairly important flour milling centre. The population of Ayr dropped from 1040 in 1891 to 761 by 1941 and she continued mostly as a commercial centre for the rural folk.

As the demand for wheat declined, many of the areas, which had been cleared earlier but were really too steep or too wet for cultivation, reverted to pasture and brush. Thus, less land was under cultivation with a resultant decrease in population.

On the other hand, the population of Galt rose steadily, though slowly, during this period, because of a steady influx of rural folk attracted to the industries of Galt. Fringe growth around the city of Galt accounted for most of the increase in population in the township in the 1920's and 30's.

During the twentieth century transportation improved to the extent that large distant centres became more accessible with the result that small local service centres declined both in importance and population. Branchton, Ayr and Roseville all suffered decline for this reason.

The dominance of people of Scottish descent in the township continued through this period although somewhat reduced by an influx of English, German and Dutch peoples. In 1871, 72% of the population was Scotch. By 1941 only 32% of the people were of this descent. However, they were still the largest national group.

Changes during this period included considerable fluctuation in the growth of certain field crops.

In 1851 wheat was grown on two-thirds of the land used for field crops and nearly all was exported as flour. In 1941, only one-fifth of the field crop was wheat, very little of which was sold commercially. Most of it was used as feed for livestock. In 1851, there were numerous flour mills. By 1941, only one cereal mill, located in Ayr, and one flour mill in Galt were left in the township. Wheat production declined over fifty per cent between 1861 and 1871 alone. The reason for this decline appears to be in the economic depression in Canada at this time. Also,

Ontario wheat was coming into competition with wheat grown on the American prairies. This decline continued after 1871 with the opening of the Canadian West. The prairie soils were better adapted to wheat growing than Ontario soils and thus Ontario lost its wheat markets. The farmers turned to a mixed farming economy, with a greater emphasis on livestock.

The other grains: barley, oats, rye and buckwheat, also lost their commercial importance during the early 1900's, mainly due to a decline in the use of these cereals as food. However, barley and oats, especially the latter, have continued to be grown in considerable quantities as livestock feed.

In 1861 Indian corn was grown by the settlers. By 1871, however, other varieties had been introduced although they were not grown extensively, the cool climate being a limiting factor.

Peas, beans and turnips used to be important feed crops and thus production of these crops was high. However, grain and corn were found to be more economical and more nutritious as feed and so this has resulted in a reduction in the production of peas, beans and turnips since 1900. 1,108 acres of turnips in 1891 were reduced to 537 acres in 1911. 42,112 bushels of peas and beans in 1891 were reduced to 7,234 bushels in 1911.

The number of beef cattle was negligible in the township in 1861. By 1941, because of the change in the type of farming, 2,849 beef cattle are listed.[1] Shorthorn and Hereford breeds appeared first in this area. There were 1,778 milch cows in the township in 1861, while by 1941 this number had increased to 3,123. With the growth of several large cities

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1. See Appendix D.

in close proximity to the township, the dairy industry has gradually been gaining in importance in order to supply these urban centres with dairy produce.

The number of sheep in the township has declined in eighty years from 7,930 to 735, mostly due to the fact that cattle can be raised more profitably and thus have taken over the pasture lands.

The number of hogs increased during the period, as well as the number of poultry, due to the development of nearby urban markets.

CHAPTER III

Present Land Use.

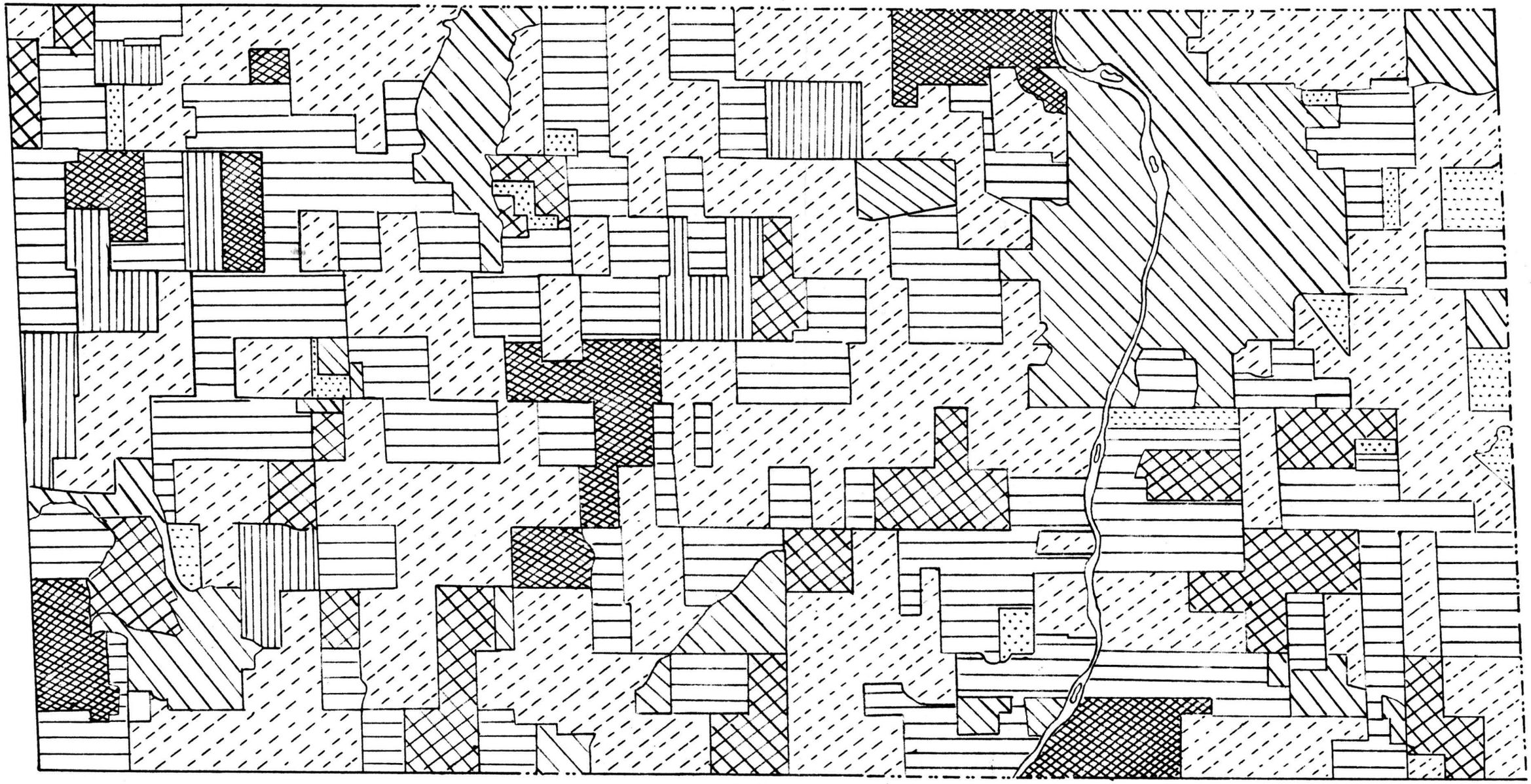
North Dumfries Township can be divided into four principal land use categories: agricultural land, forest land, quarry land and urban land. The first three categories are discussed in this chapter while urban land is discussed in chapter IV.

1. Agricultural Land

Eighty-two per cent of the township is designated in the census report of 1951 as occupied farm land. This area is predominantly agricultural chiefly because of suitable climate, fairly good soils, and proximity of markets. The type of agriculture found throughout is that of general farming, with emphasis on beef and dairy cattle.

The size of farms in North Dumfries Township varies considerably. However, thirty-five per cent range between 70 and 129 acres and twenty-two per cent between 130 and 180 acres. There are several larger farms, two of which are over 560 acres. The size of farms has, for many years, been increasing, due to mechanization and a change to a more extensive type of farming. In 1851 only eight per cent of the farms were over 200 acres in size while by 1951 nearly twenty per cent were. Generally, beef cattle farms are larger than the dairy farms for an average dairy farm does not require as many cattle as an average beef farm. Figure 7, which is based on the 1956 assessment figures, shows the distribution of farms according to size. Due to widespread distribution of all categories throughout the area, a distinct correlation with physical and cultural features is difficult. However, the farms located on the till moraine, especially to

48 Figure 7



FARM SIZES IN ACRES
NORTH DUMFRIES TOWNSHIP

N

LEGEND

SCALE-1 MILE : 1 INCH

	0 - 69		210 - 279
	70 - 139		280 - 339
	140 - 209		over 340
	NON - FARM		

FIGURE 7

the east of the Grand River, appear to be on the average somewhat larger than those on other land types, and average nearly 200 acres. On the till moraine the topography is quite rugged and much of the land is under permanent pasture. In spite of this, most of the farms over 280 acres are on some of the best land in the township, the flat to undulating till plain. Here, although the soils are deficient in organic matter and phosphate, there is good natural drainage and erosion is not severe. Here, also, a few industrious farmers settled and prospered, bought more of this good land and have become quite wealthy. The two largest farms both over 500 acres are formed of smaller farms scattered in different parts of the township. Each of these smaller farms is run as a separate unit.

The total assessment for all the land in the township is $6,676,591. Assessment values for the agricultural land average between $30.00 and $40.00 an acre, with some reaching as high as $60.00 an acre. Proximity to urban centres and markets for agricultural produce is the main reason for these high land values. The soils are excellently adapted for grazing and these products are easily sold nearby. The lowest valued farms, averaging around $25.00 per acre, are located north-east of Galt, south-east of Galt, in the area in Concession IV known as the Alps and around Wrigley Corners. The first three areas are regions of hilly till moraine while the latter is a region containing considerable swampland. All areas make poor farm land, resulting in a low assessment value. Most of the highest valued land is located on the till plain, where most of the exceptionally prosperous farms are located.

The occurrence of farmsteads and rural non-farm dwellings as seen in Figure 9 indicates the population distribution throughout the township. The 1951 census listed 285 farm operators in North Dumfries Township of which 234 are owners, 28 part owners and the remainder either tenants or managers. The large owner-operator percentage illustrates the economic stability of this area.

Farmsteads do not change greatly in appearance from one region to another. Thus, no definite zones relating to value can be differentiated. One outstanding characteristic of the area is the great number of stone houses. Most of these houses were built around 1860 to 1880 during a period when this type of house was popular. Limestone was easily obtainable from Beverly Township to the east and so a great many of these homes were built to replace the first log dwellings.

Farm abandonment is not a problem. There are a few deserted farm houses but the land around them is being cultivated. This illustrates an increase in the size of farms. In the area north-east of the city of Galt, there are a few farms not being worked while the homes are occupied by urban workers. Most of this land has been zoned by Galt for industrial purposes and will soon be taken over by the city.

A small proportion of the agricultural land is occupied by rural non-farm residential dwellings. These are found mostly along the highways in the township or just outside the city limies of Galt. Most of these people work either in Galt or Ayr and accessibility to these places is important to them. Commercial enterprises are located on the main highways. Here transient as well as local business is available. There

This is a typical stone farmstead, built from local limestone.

Much of this stony till moraine is under pasture. Notice the piles of stones indicating an attempt to improve the land.

are several gas stations on Highway #8, one on Highway #24, and one on Highway 24A. Schools are distributed throughout the township.

Of the total land in the township listed as occupied farm land, 76.6 per cent is classified as improved or as land cleared for crops and pasture. The remainder is classified as unimproved and is composed of woodland, swamp or bush.

The land use map[1] indicates the pattern of land use as it was in the Autumn of 1957. The pattern may change from year to year, but only to a slight degree, By grouping the three land use categories grain, hay and pasture together, on different percentage bases, any variations in land use occurring in the township may be observed clearly.

One important land use category is grain. This includes wheat, barley, oats, rye and corn, and occupies about twenty-five per cent of the occupied farm land. Distribution throughout the township appears to be fairly even although some concentration appears on the fairly level and well-drained till plain, and less is grown on the till moraine and outwash plain. Large areas on the till moraine cannot be cultivated because of steep hills and stony soils, interspersed with many ponds. On the outwash plain, stony soils as well as many kettles hinder the cultivation of the land. However, all the well-drained soils in the township are stony and require fertilization for high yields, so that no area is particularly well-adapted for grain.

Oats constitutes the leading crop in the region and occupies 5,297 acres.[2] Oats does not have as rigid soil requirements as do either wheat or barley. Nevertheless, fair drainage, a good moisture supply, a temperate

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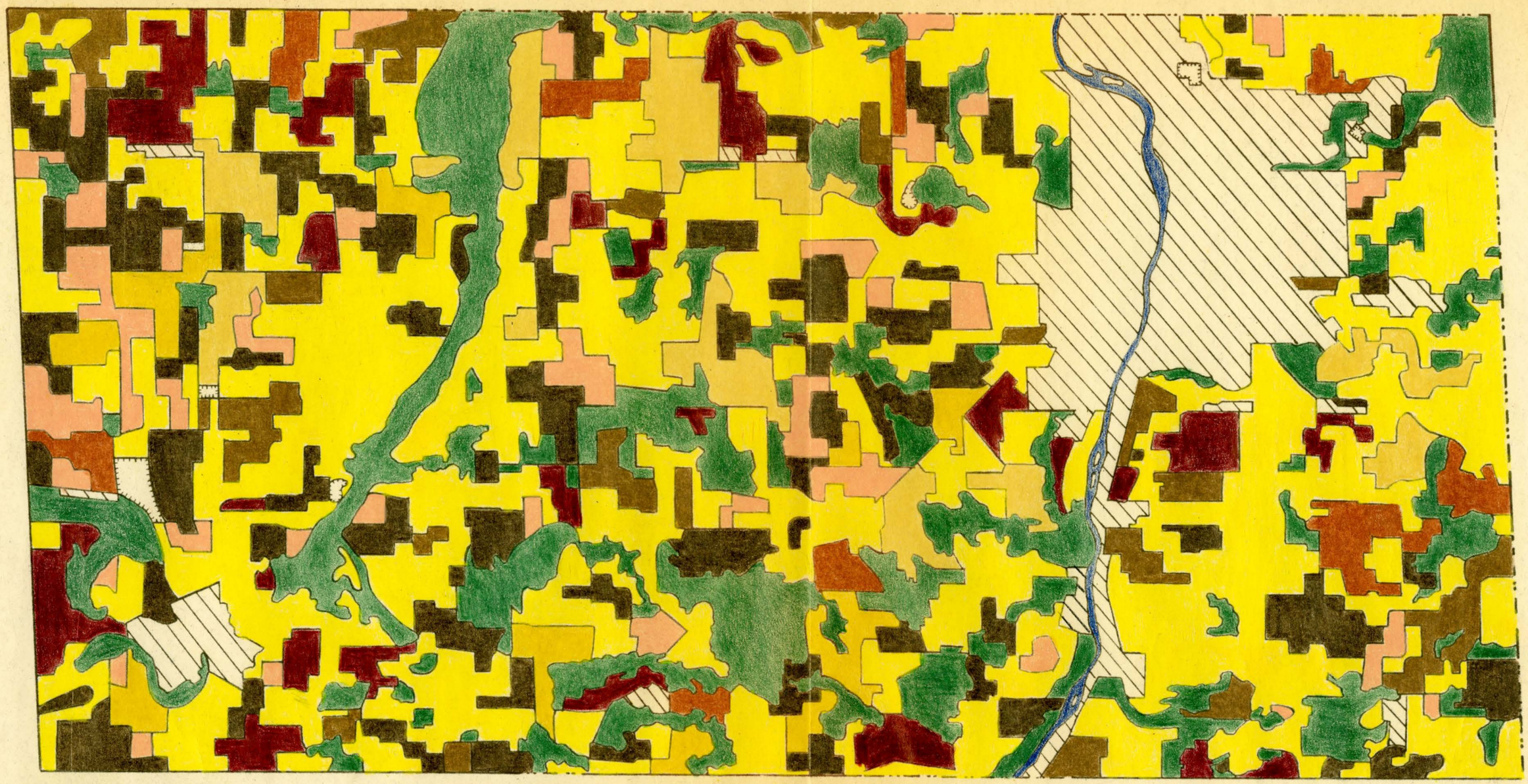
1. See Figure 8.
2. Crop Statistics were obtained from 1951 Census Reports.



LAND USE OF NORTH DUMFRIES TOWNSHIP

N

LEGEND

SCALE 1mile : 1inch

- ⅓ grain, ⅓ hay, ⅓ pasture
- over ½ grain, the remainder hay and pasture
- over ⅔ grain, the remainder hay
- over 9/10 grain
- ½ grain ½ hay
- over 9/10 hay
- over ½ pasture, the remainder hay and grain
- over 9/10 pasture
- Grand River
- urban; idle land
- woodland, swamp including small lakes
- quarries

FIGURE 8

climate and some fertility are needed for growth, and these are available in North Dumfries Township. All of the oats grown is used as feed.

Three thousand nine hundred and fifty-one acres of wheat are grown in the township. The winters are sufficiently mild so that a very large percentage of this crop is sown as fall wheat. This crop requires medium textured soils, good drainage conditions, and a moist growing season. The Guelph loam soils of the till plain have all three of these requirements. However, fertility, another important requirement, is somewhat lacking. Nevertheless, this is the best soil for wheat in the township and as a result the largest concentration of this crop appears on these soils. However, with fertilization fairly high yields can be obtained from the other soils in the township. The wheat is grown mostly as feed for the livestock with a small percentage being sold commercially as seed grain.

Barley is grown on only 276 acres. There is little commercial market, today, in North Dumfries for this crop; therefore what is grown is consumed locally as feed. Although in this township conditions are suitable for barley, the reason for the small production is that other grains are more preferred as feed.

Only 191 acres of rye are grown. Rye is the least exacting of the grains in its soil requirements. Soils which are too poor to grow other crops are planted in rye. Most of North Dumfries is suitable for other grains so the acreage of rye is small. What is grown is used primarily as feed.

Mixed grain has only been grown in the Township during the last 40 years. It now occupies 2,286 acres, primarily for feed.

About 1000 acres of corn are now grown in the township, also primarily for feed. Corn requires relatively high temperatures and an abundance of readily available plant nutrients, during the growing season. Neither of these requirements is very satisfactorily fulfilled in North Dumfries, and yields are not very high.

Hay is designated as a separate category on the land use map mainly because of its greater importance as a fodder crop than any of the other field crops. In 1951 it occupied 6,839 acres. Clover, alfalfa and timothy are the common hay crops. During the first year after seeding, there is only one crop but during the next year or so several crops per season are obtained. An alternative to cropping is to allow the livestock to pasture the field after one or two cuttings. Low yields of hay result unless cultivation, reseeding and fertilization are carried out every few years. The hay is grown for livestock feed rather than as a cash crop. It appears to be grown in approximately equal proportions on each land type in the township.

Potatoes and other root crops are grown throughout the region in very limited quantities: the total area occupied thereby is only 267 acres and most of this is in small plots. Part of this crop is grown for cash sales, most being sold locally, although the bulk is used as feed, especially for the hogs.

The climate is a hindrance to the production of long season fruits and tender crops. Most farms have small orchards but little fruit is sold commercially.

The tendency throughout the township, is to grow only enough hay, oats and wheat to feed the livestock. Fertility needs, stony soils,

steep morainic hills and an abundance of kettle lakes are the main hindrances to cultivation in the township.

Control of sheet erosion especially on the till moraine land type is necessary in order to preserve the top soil. Much has already been lost, and thus a great deal of the very steep land has reverted to pasture.

The livestock population for North Dumfries Township in 1951 can be seen in Appendix D. Dairy cattle predominate over beef cattle. The proximity of the township to several large urban centres, all consumers of milk and milk products, is the main reason for the dominance of dairying. With the development of the bulk tanker, and the recent expansion of urban centres even larger markets are served by North Dumfries' farms. Because of this, dairy farming in the township is becoming even more dominant. At present, milk, from the eastern half of the township, is sold to Galt, Hamilton, Toronto and Brantford. The western half sells its milk to Kitchener, Waterloo and New Dundee as well as to Galt. About 50% of the dairy cows are Holsteins. The remainder consist of Guernseys, Jerseys and Ayrshires.

Most of the beef cattle are raised in the western part of the township. This section is further from the largest concentration of population and thus dairy farming is not as dominant as it is to the east. Aberdeen, Angus and Shorthorns are the common types of beef cattle in the township. There are not many Herefords in the area. Most of these cattle are sold to meat packers in Toronto, most being transported by way of the stockyards in Ayr. Although markets are plentiful, dairy farming is more profitable, and thus the number of beef cattle are declining.

One of four large turkey farms.

A Holstein dairy herd grazing on a seeded pastureland on the modified till plain.

Machinery has now largely replaced the horse in the Township, particularly since 1930. It was during the 30's that the combine came into general use in the area.

Sheep raising has declined probably because other types of livestock may be raised more profitably.

The number of hogs has increased slightly since 1941. Markets are available and the dairy industry provides the milk necessary for them. Pigs are sold to Kitchener and Hamilton.

Many of the beef and dairy farmers keep several hundred poultry as a secondary source of profits. Eggs are sold to two hatcheries, one near Brantford and the other near Branchton where they are hatched and the chicks raised as broilers. The rest are sold to Toronto wholesalers for eating purposes.

Four turkey farms are now operating in the township. Great care must be taken to raise turkeys successfully. However, the township is ideally located in relation to several large urban markets and transportation is good, so, these enterprises have prospered. Turkeys require well-drained soils and cannot survive on wet swampy ground. All four farms are located on either the Waterloo Sandy loam or Burford loam soils, both of which are well-drained. These two soils are low in fertility, and thus turkey farming is probably more profitable to these farmers than cultivation of the land.

2. Forest Land

Forest in North Dumfries Township occupies nearly 20% of the total area of the township. About 11% occurs as woodlots on occupied farmland. The rest is found scattered throughout the township on land too poor for agriculture, mostly because of poor drainage or rugged relief. The Muck Land Type, the three largest areas of which are the Roseville Swamp, Wrigley's Corners and Waterloo County Forest is covered with a forest growth.

Much of the Roseville Swamp is covefed with white cedar. This swamp has all been sold in plots of 2 - 10 acres each to individuals who occasionally cut some of the trees for firewood or other purposes. At the present time cutting is restricted by the conservation authorities who have carried on some reforestation in the area.

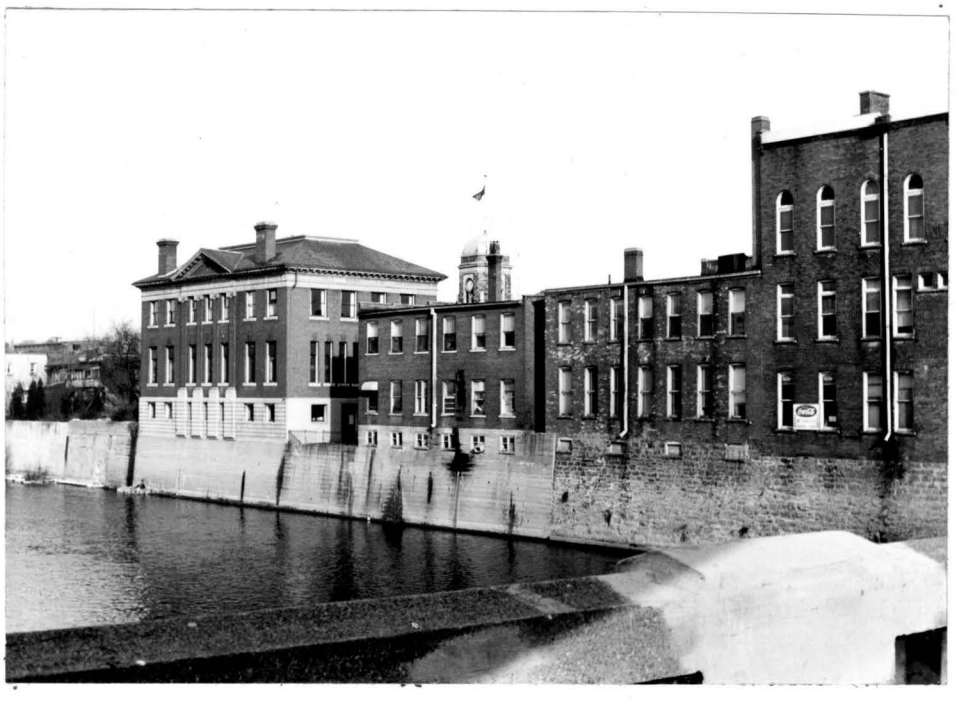
The swamps around Wrigley's Corners are privately owned, but this area has not been divided into such small plots as in the Roseville Swamp.

A large area of the Waterloo County Forest is located in North Dumfries Township. Much of it is in swamp but in the drier places considerable reforestation has taken place since 1944, under the auspices of the Grand Valley Conservation Authority.

3. Quarry Land

Several gravel pits are located in the township on the outwash plain land type. Three are located near Ayr, one near Barrie Lake and two in the northeastern part of Galt. The largest pit,which is north of Ayr was opened in 1922 by the C.P.R. and large quantities of gravel are still being extracted.

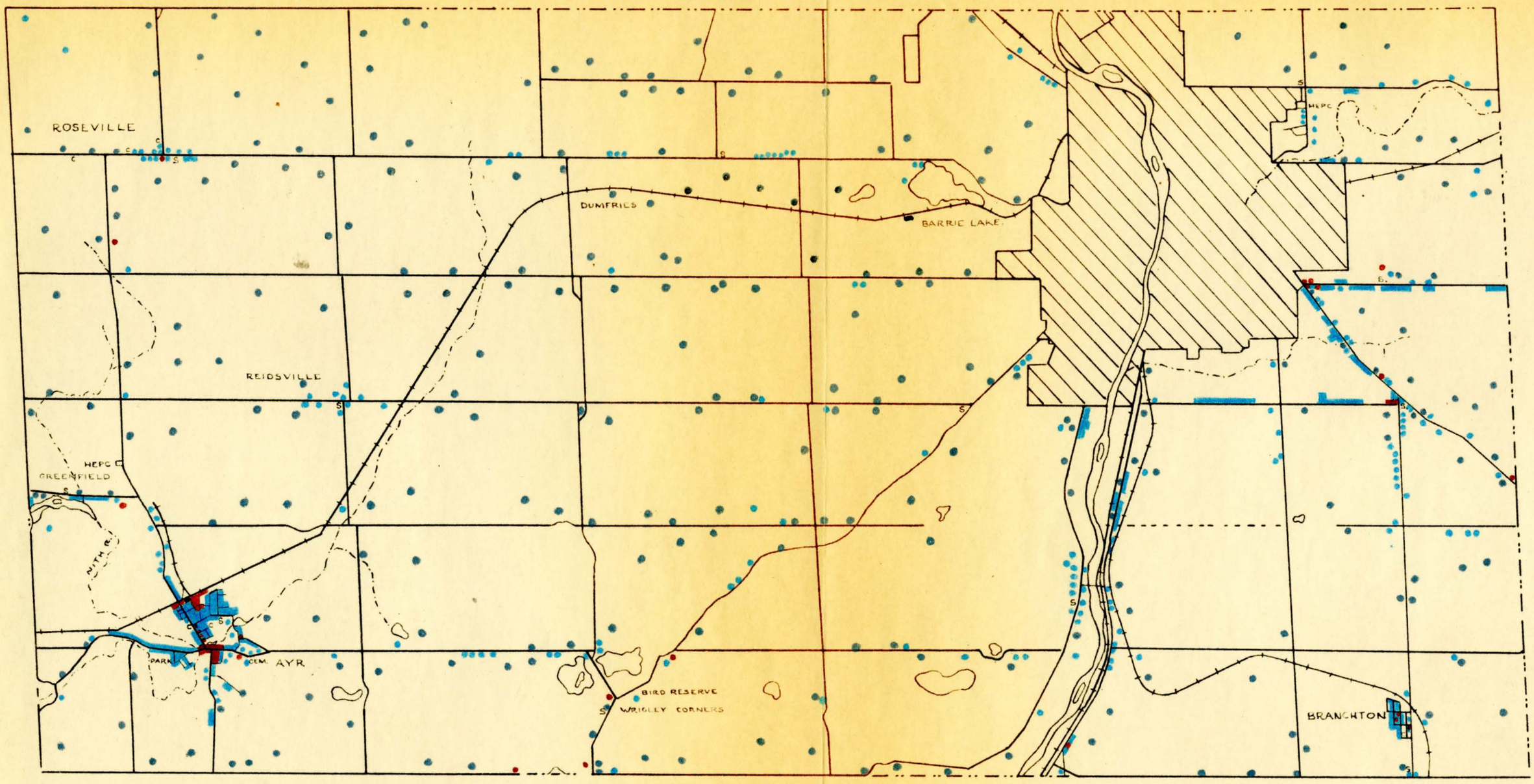
The CPR gravel pit located on the outwash plain.



The Grand River is confined by concrete walls in the central section of Galt. These were built in an attempt to prevent serious flooding of the commercial area. Note high water level.

These pits adequately supply the area with sufficient gravel for building purposes etc. Because of the large acreage of this outwash gravel plain there will never be a shortage in this area of gravel.

Fig. 9



LOCATION OF BUILDINGS IN NORTH DUMFRIES TOWNSHIP

SCALE 1 MILE : 1 INCH

N

- RESIDENTIAL - NON-FARM
- FARMSTEAD
- COMMERCE
- INDUSTRY
- C CHURCH
- S SCHOOL
- RAILWAY STATION
- CITY OF GALT
- ROADS
- STREAMS
- LAKES
- RAILWAY
- TOWNSHIP BOUNDARY

FIGURE 9

CHAPTER IV

URBAN LAND

A. An Urban Study of the City of Galt.

The city of Galt, with a population of 24,850[1] and occupying an area of 3520 acres is the second city of Waterloo County[2]. It is especially noted for the manufacture of metal goods, textiles and shoes. It has been called the "Manchester of Canada" because of its many textile plants.

This study has been divided into several sections, including a discussion on the physical setting, a consideration of the various land use categories as designated on the map of Galt, and a discussion on population trends.

1. Physical Setting

Galt is situated at the junction of the Grand and a small tributary known as Mill Creek. It is built on sand and gravel outwash laid down by glacial meltstreams. Two groups of terraces can be seen in Galt along both sides of the river. These were formed by meltstreams flowing into two proglacial lakes, one considerably lower than the other.

On the east side, another meltstream valley cutting through the city creates a break in the terrace wall. Thus, the double terrace on the east side is not too clearly seen. However, the land south-east of Main St. is actually about 50 feet higher than that north of Main Street. A more distinct double terrace can be seen both north and south of the city limits.

In past years Galt has suffered from considerable flooding of the Grand River, mainly due to forest denudation at the river's headwaters. Recently,

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1. City of Galt Census, Oct.1, 1957.
2. 1st city - Kitchener - 10 mi. to the north-west.

POPULATION TRENDS
IN THE
CITY OF GALT
1851-1957

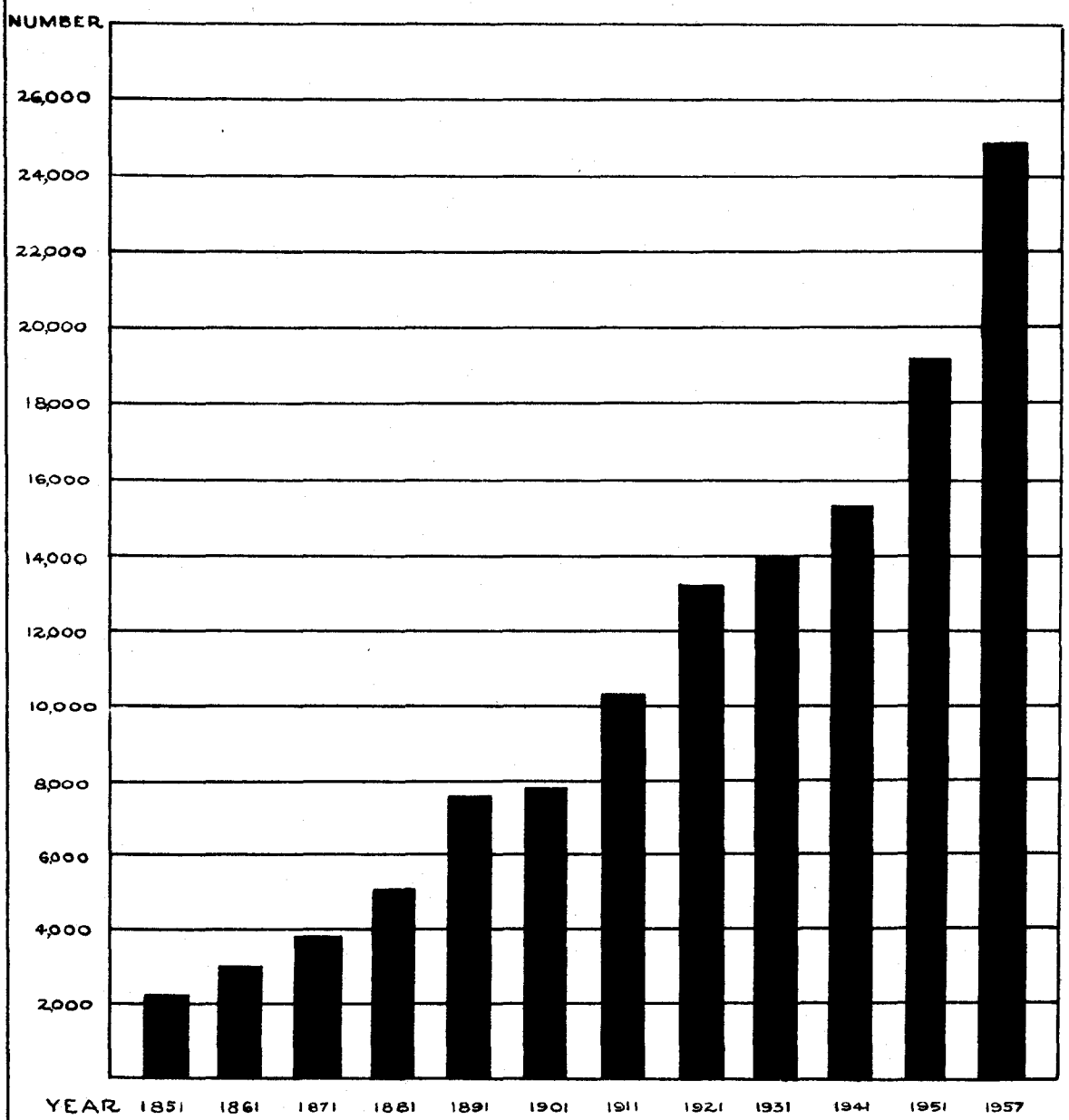


FIGURE 10

certain precautionary measures have been taken. Two dams have been built north of the township, and in several of the buildings basement windows have been sealed.

2. Present Land Use

(a) Industry

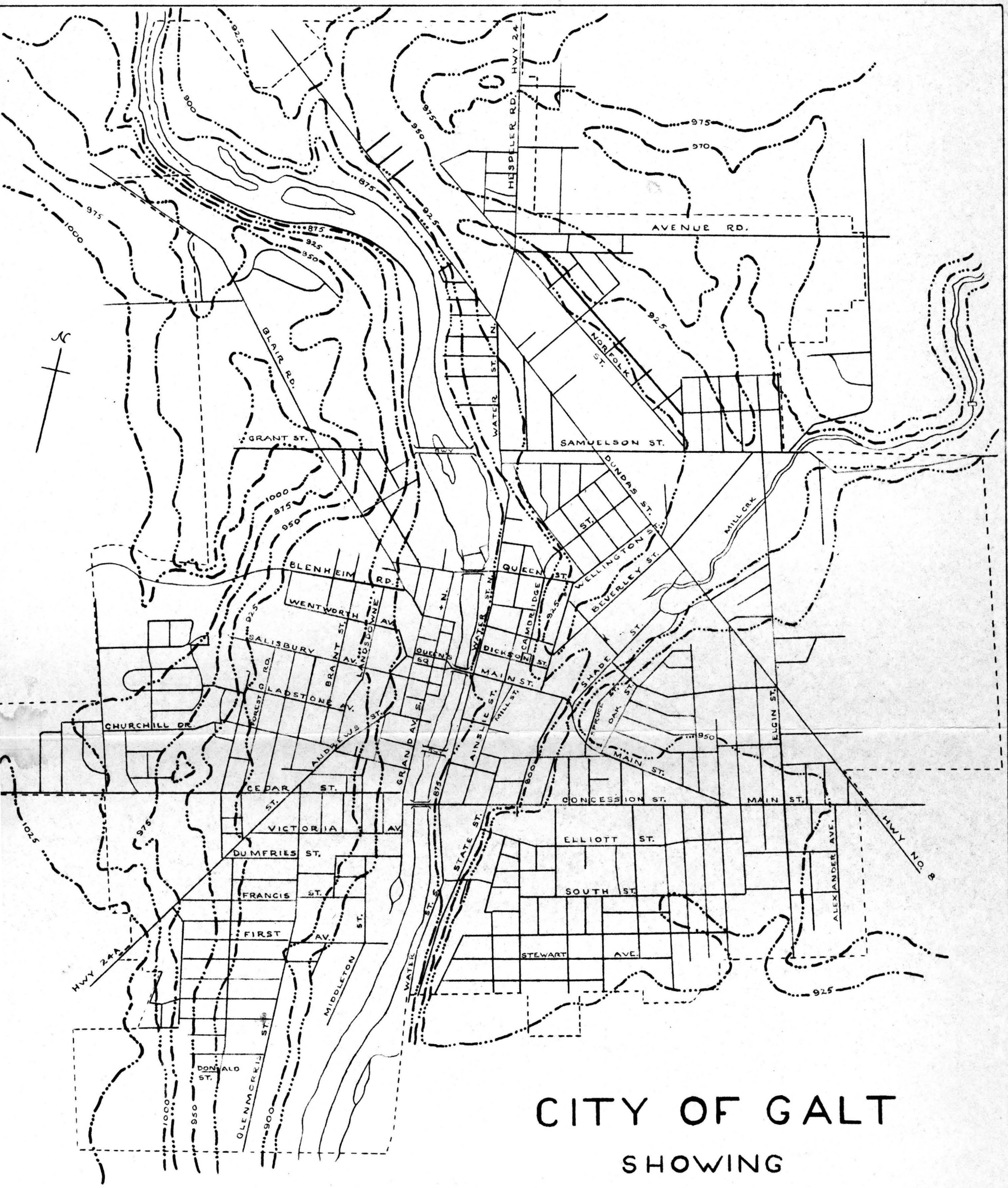
Since Galt's beginning, industry has been a leading factor in its growth and prosperity. In the 19th century superior water power facilities attracted industry but much of the success of these industries should be attributed to the perseverance and foresight of their founders who helped develop it to the extent that now most of these industries are known across Canada.

The number of industries increased steadily up to 1950, but then, with the opening of a Board of Trade there was a sudden rise in numbers. Since the war, industry has developed with amazing rapidity throughout most of Canada but at first Galt was not affected to a great extent. It is not enough today for a city like Galt to have a few geographical and sociological factors favorable for industry. Other cities have advantages also. It is necessary to advertise and seek out industry, looking for relocation. Galt has only begun this work in the last few years, but now it is benefiting greatly from its efforts, for in the last five years, 19 new industries have been attracted to it.

Interviews were made with different companies in order to ascertain the reasons for certain industries locating in Galt, the source of raw materials, the markets of the finished products and the mode of transport-


N
S
C
500 0 500 1000 2000 3000
SCALE (in feet)
FUNCTIONAL MAP
OF THE
CITY OF GALT
RESIDENTIAL - CLASS I
RESIDENTIAL - CLASS II
RESIDENTIAL - CLASS III
RESIDENTIAL - CLASS IV
COMMERCIAL RETAIL OFFICES, etc.
INDUSTRY GENERAL
INDUSTRY HEAVY
PUBLIC UTILITIES
INSTITUTIONS + GOV'T SERVICES
HYDROGRAPHY
CEMETERY
AGRICULTURE
WOODLAND + MARSHLAND
IDLE LAND
RECREATION
RAILWAYS

FIGURE 11



CITY OF GALT

SHOWING

STREET NAMES

CONTOURS

CONTOUR (900)

CONTOUR INTERVAL 25'

ALL ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL

FIGURE 12

ation most frequently used. Any tie-in between the different industries within Galt was also observed.

There are several factors which make Galt a preferred city for industrial location. The size of Galt is important. Today, many companies are seeking out small cities in which to locate their factories. In many cases advantages such as cheap labor and low taxes are more profitable than proximity to markets and raw materials.

Galt's location in the centre of a densely populated region, as well as being centrally located with respect to Toronto, Hamilton, London and Windsor, ensures the city plenty of markets. Montreal, too, can be reached overnight. Proximity to Hamilton ensures ready supplies of iron and steel for the many industries requiring this raw material.

Workers can be drawn from Preston, Hespeler, Guelph, Kitchener, Waterloo, Ayr, Paris and Brantford, all surrounding Galt within a 15-mile radius. Besides the plentiful supply of labor, there have always been excellent employer-employee relationships in this city, the reason for this being that growth has been steady with a long history of stable industrial progress.

Galt is serviced by both the Canadian National and Canadian Pacific Railways and a local line, the Lake Erie and Northern Railway. Galt is on the direct line of the C.P.R. from Chicago to Montreal which runs east and west through the city. Some of the newer industries located along Highway #8 use this line as their main means of transportation. The presence of this railway is one of the main reasons that the area on the east side of the city has been zoned industrial. There are two branch lines of the C.N.R. passing through Galt. A line from Guelph serves most of the industries

on the east side of the Grand and a line from Harrisburg to the south serves several industries on the east side of the river including some along Highway #8.

The Grand River Railway runs from Port Dover on Lake Ontario to Galt. It links some of the industries to the main line of the C.N.R. through Paris. The C.N.R. Railway runs along the Grand River and Mill Creek, using their valleys, while the C.P.R. cuts across the Grand Valley. Thus, together they offer a large area where railway access is available to industry. Indeed, most industries are served by at least one of the railways.

Road transportation is fair. Highway #8 to Hamilton is winding but it is now used as a major trucking route. No doubt Highway #401, which is now being built to pass about one and a half miles to the north of Galt, will be a great stimulus to transport companies. Several local cartage companies capable of handling industrial type cartage including machinery and heavy goods are available. Indeed, many of the industries use truck transport for shipments to nearby towns and cities.

There is a commercial airport eight miles to the north-west, although at the present time only non-schedule charter service is available. This is a new government airport and air passenger and air cargo forwarding service is anticipated immediately. If speed was important small products could be transported by this means. Malton airport is only 59 miles away, and here air connections to all parts of the world are available.

Galt is fortunate in having an excellent supply of exceptionally pure water. The city and its surrounding territory is underlain by gravel beds

and limestone bedrock. Ground water can easily seep through the gravel and this water has evidently collected in a channel under the city from which Galt draws its supply.

Electric power is received from Queenston in sufficient supply for most industries.

There is plenty of land available for industrial purposes, especially to the north-east, alongside the C.P.R. line, an area which was recently zoned as industrial by the city. Fifty acres were purchased there recently by an American Company, manufacturing electrical appliances. A new plant will be built on this site to open in July, 1958, employihg 300 people.

With Galt's long attachment to metal industries, textiles and shoes, there is a greater supply of skilled workmen than in other places of equal size. Textile mills also, have always found plenty of female labor available, mostly the wives of the workers in the metal trades.

Many large U.S. companies are building plants in and around Galt. They have realized the need for decentralization and because of the reasons stated above, they have chosen Galt as the centre for their Canadian operations.

It should be noted that in Galt today there are two main industrial areas. The older one is located along the Grand River. A newer region, which has developed because of the need for more land, is located along Highway #8. Both areas have rail facilities.

Industry in Galt has been divided into two main types, heavy and general. Several factors were taken into consideration in making the

division. Heavy industry includes those industries which deal with large amounts of bulky, raw material, and need a large factory and heavy machinery to turn out a bulky finished product requiring, principally, rail transportation. The use of large amounts of coal, gas and oil also designates this type. Babcock and Wilcox, Goldie and McCulloch is the only industry in Galt designated as heavy industry.

The following is a discussion of each general type of industry.

1. Iron and Steel

The iron and steel industry is the largest employer of workers in Galt at the present time. One establishment, Babcock and Wilcox, Goldie and McCulloch Co.Ltd., making steam powerhouse equipment, has been classified under heavy industry. Employing 600 individuals, it is the largest single company in Galt. It is located on Dundas St. or Highway #8 with access to both C.P.R. and C.N.R. Its fourteen acres of land will allow plenty of room for expansion when the need arises. This company originally began on the east side of the Grand just north of Cedar Ave., but because of the need for more space, not available in this location a move was made to Dundas St. More railway facilities were also available at the new location and there was no threat of flooding.

The rest of the iron and steel companies have been classed under general industry. The finished products are, in most cases, small. These include soil pipe and fittings, manual and automatic motor controls, grey iron castings, taps and dies, machine tools, woodworking machinery, precision cutting tools, custom machinery, steel forgings, sheet metal work, tools and dies for

Babcock & Wilcox, Goldie & McCulloch Co. Ltd. This heavy industry makes large steam boilers for the manufacture of thermo-electricity.

Royal Metal Manufacturing Co. Ltd., an example of a newer industry located in Galt on Highway # 8. It manufactures metal furniture.

aircraft, office equipment, adding machines, safes and cash registers, metal furniture, ventilating, heating and air conditioning equipment, and saws and files. There are 42 such factories employing 2490 workers. Most are small companies although four of them employ between 100 and 200 and four others have 200 to 250 workers. In the last five years, several new iron and steel industries have become established in Galt. Most of these industries are situated along Dundas Street, because so many have only located in Galt in the last twenty-five years. Some of the older companies, which originally began as small foundries are located surrounding the main commercial zone and on the west wide of the Grand River. To begin with, water power was probably the main factor in establishing this type of industry by the Grand River. Access to the C.N.R. line, which runs along the Grand and was the first railway in Galt, was another locative factor.

Interviews were carried out with representatives of the firm of Babcock and Wilcox, Goldie and McCulloch, Co. Ltd., the one industry classified in this study as heavy, and with Canada Machinery, a general industry making machine tools and woodworking machinery, located along the Grand on the C.N.R. line. Both companies get most of their steel from Hamilton by rail, although a small quantity is imported from the U.S.A. Both have spur lines to the factory. Modern machinery is used in the manufacturing process and the finished product is shipped mostly by rail to all Canadian markets. Neither company has regular foreign markets. It is interesting to note however, that both companies have foreign connections. The Goldie and McCulloch Co., is in partnership with the U.S. firm of Babcock and Wilcox and Canada Machinery is owned by a German firm. There are no foreign

exports because other branches of the firm serve these markets. This is true of several of the other companies.

2. Other Metal Industries

Other metal industries, including the manufacture of aluminum, copper, brass and bronze products, are also quite important. All have been classed under general industry. There are six companies employing 301 persons. The largest one manufactures brass plumbing fittings, and reciprocal tanks and employs 150 people. Most of this type of industry has been established in Galt only within the last 20 years. Five of these are in the north-east section of the city, which is the newer industrial area. Here, there is room for expansion and there is no danger of flooding as in the older industrial sections along the Grand.

3. Textile Industry

The second largest employer in Galt is the textile industry. It has been a vital part of Galt for ovef a hundred years. Some 1,413 persons are working in factories. All are designated in this study as general industry. The largest privately-owned textile enterprise in Canada is formed by the three largest and oldest companies in Galt, under joint ownership. It began with the use of Galt's water power facilities; in fact, the waterwheel in the C. Turnbull Company was only removed 2 years ago. However this industry seems to have prospered largely because of the ingenuity of its owners. Perhaps today these concerns might just as well be located elsewhere. Certainly climate cannot be considered a favorable factor. During dry

spells, an artificial watering system to keep the air moist, must be set up within the plants. However, these works are well established and the trained labor is available. Products include woollen and worsted fabrice for men's and women's clothing, silk, nylon and terylene yarns, worsted and woollen yarns, knitted goods, bedspreads, terry towels, underwear, sportswear and pyjamas.

In an interview with Newlands and Company who employ 500 persons and manufacture worsted and woollen yarns and knitted goods, it was established that the textile industry in Galt has not suffered to the extent that others have in various parts of Canada in recent years. Good management appears to be the main reason for this good fortune. Most of the textile companies in Galt are old established firms. One industry in the textile trade did close down, but since then a new one has taken its place.

Raw cotton is generally imported from the U.S.A. although some comes from India and Egypt. Raw wool comes from Australia, New Zealand and Argentina. Today many synthetic fibres are used, not only to make synthetic fabrics, but also to add strength to cotton and woollen materials. Orlon and nylon yarn is purchased from C.I.L. Markets for the finished products are Canada wide, but there is no export to other countries. There is occasionally some transfer of products from one company to the other within Galt; e.g. for the past year Turnbull's have been using Newlands' wool yarns. This, however, does not appear to be a general practice, because most of the products are not such as can be used by other companies in Galt.

Newlands and Co. Ltd. A large textile mill manufacturing woollen yarns and knitted goods, located on the C.N.R. line in central Galt.

Scroggins Shoe Co. Ltd. A large, well-established company making women's footwear. Note the steep bank of the river cut into the limestone.

4. Leather Industry

Another industry of some importance is that manufacturing leather products. There are six firms of this type employing 725 persons. The four largest of these make women's and children's shoes. Of the other two very small establishments, the one makes leather belting and the other constructs industrial leather belting and office furniture.

The first shoe factories located in Galt because of the excellent water power facilities. Two of these companies are located along the Grand in the older industrial section. By the time this advantage had declined in importance, skilled workmen were available and this then became the main locative factor.

The newest company of this type to locate in Galt is situated in the south-west of the city in the centre of a new residential area. There are no rail connections although it is not far from Highway #8. There does not appear to be any specific reason for locating here except that land was available.

Interviews were conducted with executives of the two largest shoe companies. Some leathers are imported and others are purchased from Canadian tanneries, depending on the grade of leather required. Rail transportation for these products is preferred, three of the companies having direct rail connections. Both of the companies interviewed had all-Canadian markets. Galt is the preferred centre for Canadian shoe manufacturing because of the skilled labor available.

5. Plastics

The plastic industry is growing in importance in Galt. Four hundred of the 458 employed in this industry are on the payroll at Canadian General Tower. This company makes plastic sheeting, and upholstery, rainwear, baby wear, rubber and vinyl flooring and protective clothing. It is both a primary and secondary plant in that it makes the plastic itself as well as the finished retail product, e.g. raincoats. Galt was chosen for the establishment of this plastics factory, because an empty plant was available. At that time, a supply of water was important. Also, at that time, the Grand was used for sewage disposal. Now, this location is considered an excellent one for the plastics plant, but for different reasons. Transportation is good, there is plenty of room for expansion and the labor supply is abundant. A new addition has just been completed, which points to the future prosperity of this industry and to Galt as a whole. Finished products are sold all across Canada, with distributing warehouses found in Vancouver, Winnipeg and Montreal. Unlike many of the other industries in Galt, the plastics company desires foreign trade, but the market is somewhat unstable. Rail is the most frequent means of transportation, the company having a spur leading directly to the factory. Competition in this field is keen and good management, as well as a favorable location, is important.

6. Woodworking Industry

There are eight small woodworking firms employing 190 people. The largest which supplies lumber and produces sashes and doors employs 120. Other wood products manufactured include display racks for rugs and linoleums, wooden heels and wood patterns, lumber and building supplies. Wooden heels are used by the shoe industry.

7. The Food Industry

This industry is necessary in all urban centres, and thus there are no geographical locative factors. In Galt there are 147 people employed in 4 dairies and 4 bakeries which serve Galt and the surrounding suburban regions.

8. Miscellaneous Industries

There are several miscellaneous industries, each employing less than 30 people. Products include paper boxes, paints, varnishes, mops and brooms, soaps, cleansers and chemicals. Of special significance is one flour mill manufacturing flour for export. This is now the only flour mill remaining in the township, from a once prosperous industry.

(b) Commercial

Another important function of an urban community is to serve the surrounding territory commercially. Galt's retail merchandise and service zone is a compact area centrally located within the city along Main Street between the Grand River and Shade Street and stretching north and south along Water Street and Ainslie Street. This is the area where the village of Shade's Mills began. Also, some commercial enterprises such as gas stations and grocery stores are scattered throughout the rest of the city.

This view, looking east up Main Street, shows the main commercial zone of Galt. Banks are located on all four corners of the intersection in the foreground.

This view taken from one of the meltstream terraces looks westward over the central business section of Galt. Main Street is in the center foreground. Several church spires appear in the background.

Galt has a total of 233 stores employing approximately 833 employees.[1] These include 71 food stores, 7 general stores, 29 automotive enterprises, 18 filling stations, 45 apparel stores, 16 hardware stores, 18 furniture and electrical appliance stores, 9 drug stores, 1 second hand shop, three florist shops, and 37 miscellaneous stores.

The only commercial warehouse in Galt is one dealing in foreign imports. Wholesale grocery products come from Hamilton and Toronto, and furniture and appliances from Kitchener.

Branches of six chartered banks and also of the Waterloo Trust and Savings Company are all located here in downtown Galt. All four corners of the main intersection at Main and Water Streets are bank premises. This intersection is where Highway 24A meets Highway 24, and throughout the history of Galt has always been a main crossroads.

Commercial services in the city include barber and beauty shops, repair services, personal services and amusements. The city has three theatres, five bowling alleys, a radio station, a dance hall, and two hotels. A daily newspaper with a circulation of 11,700 supplies the residents with the latest news of world and local doings.

During interviews covering individual stores as well as two central banking houses, an attempt was made to ascertain the zone of maximum commercial influence of Galt. Because of the proximity of several other urban communities the commercial facilities of Galt are more limited than is usual for a city of this size. However, one might say that Galt, Hespeler, and Preston serve South Waterloo. Because Galt is much larger

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1. 1951 Census reports.

COMMERCIAL ZONE OF INFLUENCE OF AYR & GALT

SCALE: 3·95 MILES TO 1 INCH

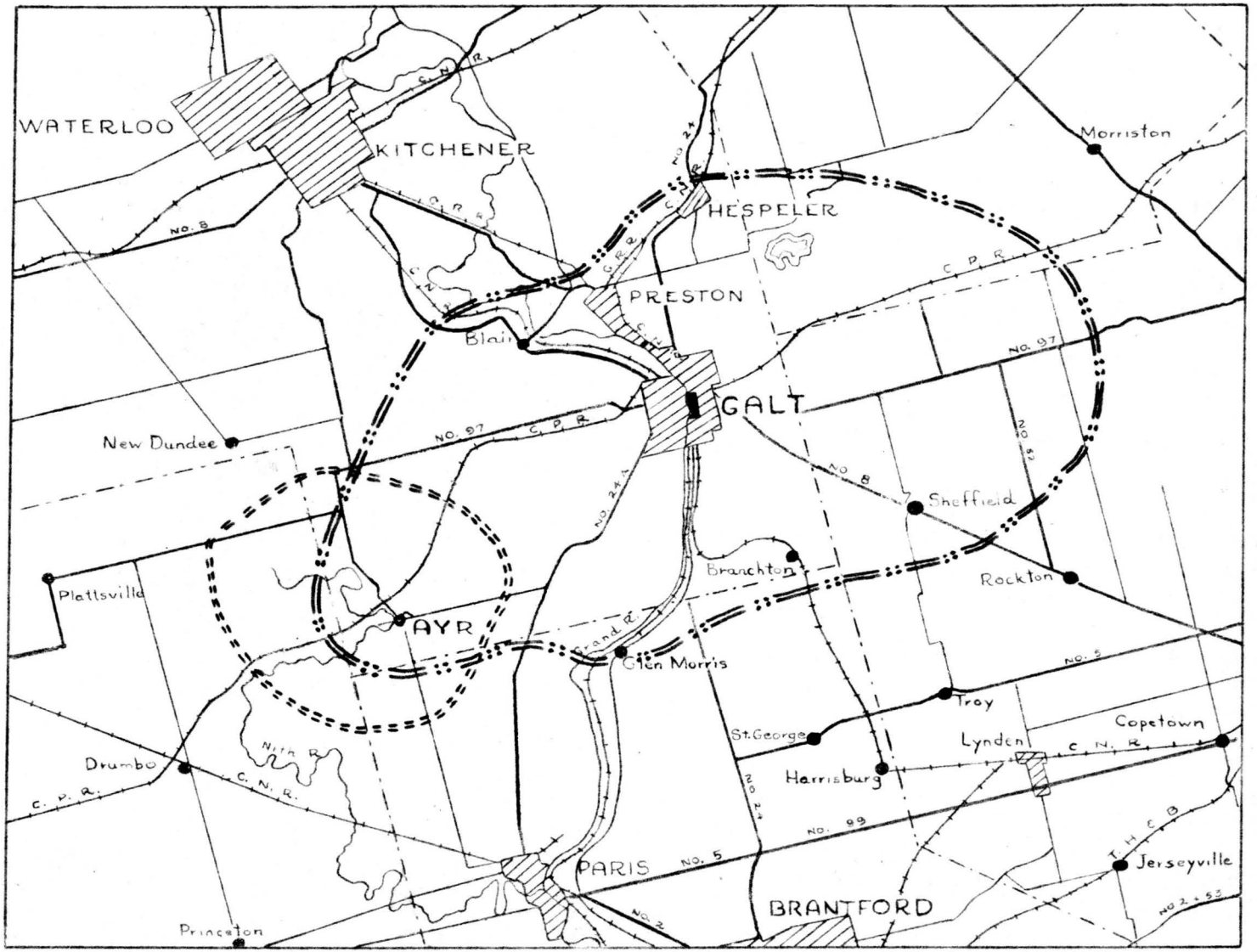

FIGURE 13

than either Preston or Hespeler it exerts considerable influence on both of these centres. To the east, Galt's influence extends to Sheffield but not to Rockton. To the south it includes Branchton and Glen Morris and extends nearly to St. George where it merges with Paris' commercial zone of influence. Ayr's stores offer little but certain staple supplies and therefore it is included within Galt's trade area.

(c) Residential

One of the functions of an urban centre is to provide residential areas for its citizens. By far the greatest amount of land in an urban centre is used for this purpose.

The classification utilized in this study provides for four categories of housing, based on features such as the size of the house, size of lot, construction material, age, and the general upkeep of the whole property. The study was made more or less on a block to block basis rather than house by house. The category designated shows the type of the majority of the houses in that block. Other classes of houses may, however, be present, especially in the older residential areas where often lots, long left vacant, have at last been occupied by new, relatively well-kept houses. There are certain areas where one housing type dominates while other sections contain a mixture of types. Below is a description of each housing type and its distribution within the city.

Galt, on the whole, is a city of better homes, for it is not as yet, large enough to have a blighted zone. It has never had a large number of

First Class Home in Galt - an older home but very large and substantial. There are many homes of this type in the city.

This is also a First Class Home. These new large ranch style homes are mostly located on the west side of the river.

unemployed since labor conditions have been fairly stable. Industry has prospered here and, as a result, has brought considerable wealth to the area. Thus there is a large section of fine homes and the number of very poor homes is small. It must be remembered, therefore, that the class descriptions are made for Galt and cannot be applied to every other city or town.

The first-class homes are the largest and most exclusive in the city. Several of them are mansions. All these homes are of brick construction and have spacious, well-kept lawns. Two distinct groups can be seen within the type. One group consists of older homes, very spacious and well-kept. Most of these are found in an area bordered by Grant Street, Blair Road, Gladstone Avenue and Forest Road across the river from the business section. This area is located on the first terrace and has always been considered the exclusive residential section. A few other older Class I homes are also located on the east side of the river, the largest section being along Main Street. The other group of first-class homes are mostly newly-built ranch style dwellings all of which have a value of over $15,000. The majority of these are located above the older homes and north of Churchill Drive, an outward expansion of the older first-class area. Some are found on Glenmorris Street and Donald Street near the city limits and on Alexander Avenue.

The second-class homes are smaller but nevertheless well kept and in good condition. The majority are of brick construction and between $10,000 and $15,000 in value. This type also can be divided into two groups, acc-

Second Class Home - an older home of brick construction, well-kept but smaller than the first class homes.

These small new homes found in several new subdivisions throughout the city are also designated Second Class Homes.

Third Class Home

Fourth Class Home. Most of these homes are of poor quality and are in need of repair.

ording to age. The older dwellings of this group are mostly 2½ story, well-kept and 25 or 30 years of age. The newly constructed houses are mostly one story ranch type, neat and well-constructed although the architecture of each house tends to be much the same. The greatest concentration of this newer development can be seen south of Churchill Drive, south of First Avenue, and south of Elliott Street, while the older Class II homes although located mainly north of Main Street and east of Oak Street are also found scattered throughout the older residential area.

Third-class dwellings are also divided into two sections, Included in this type, are war-time houses. These are one-story, frame dwellings hastily constructed on small lots. Some have been fairly-well kept. One section of war-time housing is to be found in the two blocks south of First Avenue, east of Glenmorris Street, the other along Stewart Street. The remainder of the Class III dwellings are mostly two story. Many are very old; some are built close together on small pieces of ground. They may be ~~of~~ brick, frame or stucco.

Fourth-class houses are the smallest and poorest kept in the area. They are all one-story and are constructed of insul-brick, stucco or frame. The area surrounding the main commercial zone appears to have the greatest concentration of Class IV homes. Another poor area is north of Dundas Street. Large commercial or industrial blocks and the presence of railway lines tend to lower the value of surrounding homes.

Along the roads leading to Galt there is a considerable urban fringe growth. On both the West River Road and the East River Road, south to the

bridge in Con. VIII are several new, large modern homes. There are suburban homes along Highway #8, #97 east of the city, and #24A. Two nurseries, supplying Galt, are located outside the city limits. This urban expansion outside the city limits is a general trend of recent years. Land is cheaper and more easily available outside the city.

A discussion of residential land use should include multi-family dwellings. There are a few new apartment buildings located in the south-eastern section. Several of the older large residences have been converted to duplexes or triplexes.

It is interesting to note that 87% of the homes in Galt are owner occupied.[1] This indicates the stability of the region.

(d) Roads and Public Utilities

There are several other factors which are important in a well-coordinated urban centre.

Internal, as well as external transportation, is essential. Galt has eighty-one miles of streets, of which only about three miles have not been paved, either with concrete or with stone chips and tarvia. The street pattern is varied because of the contour of the land. Main St. which skirts a steep hill to the east of the main commercial zone exemplifies this factor. However, because of a tendency to adhere to a grid pattern, some of the streets in the city are quite steep. The residential area in the southeastern section of the city, though, is located on flat land allowing for a regular road pattern. Canada Coach Lines maintain an adequate and regular bus service throughout the city and adjoining municipalities.

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1. Galt Board of Trade.

Water and sewage facilities are important. Galt is fortunate in having an excellent water supply. At the present time, only one-third of the available supply is being used and the water is so pure that no processing is required. There are wells located at different points in the city, and two water towers to store the water, from which the water flows by gravity to homes and other establishments. Up to the present time the city had a most adequate sewage disposal system. Formerly, the whole city was located on terraces dipping down to the river, a factor of great importance to the sewage disposal system. Formerly, all sewage flowed by gravity to a disposal plant, along the Grand River in the south of the city. Now, however, the city is expanding to lower lands behind the terraces, especially to the north-east and north-west. From here the sewage cannot flow by gravity and so a disposal system involving more expensive mains and pressure pumps is soon to be built to service these areas. Two industries on Avenue Road are, at present, forced to rely on septic tanks, a hindrance to any industrial development requiring much water. At the time of writing, only a primary disposal unit is in operation, allowing the river to do the final processing. However, a secondary unit will probably be installed shortly for health reasons.

Power is received from the Hydro-Electric Power Commission substation on the outskirts of the city. There is no shortage of this commodity.

(e) Institutions and Government Services

The educational and religious needs of the residents of Galt are well taken care of. There are 7 public schools, 3 separate schools and

2 secondary schools providing academic, commercial and technical training. Galt Collegiate Institute and Vocational School is located on Water St.N. while Glenview Secondary School which was just opened in September 1957 is located in the south-east section of the city at the city limits to serve a new residential area.

There is a city supported Public Library centrally located on Water Street North and accessible to all sections of the city.

There are twenty-four churches in Galt. The Presbyterian, United and Anglican denominations claim the greatest number. For many years Galt has been and still is a Scottish Presbyterian stronghold. Most of the churches are located in the central section of the city although there are a few newer ones now established in the residential areas.

(f) Recreation and Parks

About 100 acres in the city is park land. The largest two parks are Soper Park off Dundas Street and Victoria Park, south of Blenheim Road; the latter contains a considerable area of forest land. Other parks are scattered throughout the city adequately serving the area. Three of the smaller ones are situated on the terraces overlooking the river and the central section of the city. Within the confines of these recreational lands are swimming pools and wading pools, while baseball, football, cricket, soccer and fastball fields are also available.

There are several other fine facilities for recreation. Galt possesses a modern Y.M.C.A., a Y.W.C.A., both centrally located, an arena located adjacent to Soper Park, a modern curling club and an eighteen-hole Golf

course and country club situated within the city limits, along the Grand River to the north. Galt also has 2 lawn bowling clubs, together with a large public tennis court and such commercial facilities as bowling alleys and theatres.

The Galt Agricultural Fair is a prominent event held yearly in the city, and attracts many entrants from the surrounding agricultural region.

3. Population Trends & Distribution

The population of Galt has increased at a fairly steady rate during the last hundred years although in the last 10 years, especially, population has increased tremendously, with the vast increase in industrial production.

The city has expanded with each increase in population. The very oldest homes in Galt are mainly located in a zone surrounding the main business area. It appears that the homes become progressively newer from the central area outwards, in all directions.

The terraces on each side of the river have been important in determining population distribution. There seems to be a hesitancy to build homes on higher terraces until most of the lots are occupied in the lower area. The upper terrace on the west side of the Grand has just been opened in the last five years, although the area just to east of it, on a lower level is now a fairly old residential area.

The west side of the river is much smaller in area than the east side. The east contains the business area, most of the industries, many of the middle and lower class homes and few of the upper class homes. It has

better rail and road facilities and is closer to eastern markets. This accounts for the greater number of industries here, and the proximity of industry has reduced the value of the residential areas.

The west side of the river is separated from most of the industry and any fumes or smoke arising from it. This is the main reason for its having such a large percentage of first class homes.

B. An Urban Study of Small Centres.

2. Small Urban Centres

Three small urban centres, namely Ayr, Branchton, and Roseville are located in North Dumfries Township.

Ayr is the largest village in the township with a population of 980. It is located on fairly low-lying land of the outwash plain, at the junction of the Nith River and Cedar Creek, and is surrounded by swamp land. In the spring the two streams overflow, causing considerable flooding, a disadvantage to Ayr, but one which can't be prevented. Like the Grand at Galt, part of Cedar Creek has been confined by concrete walls in the central business area.

The town serves the surrounding area commercially, this being its most important function. The commercial zone is centrally located within the village at the junction of the Nith River and Cedar Creek, near the site of the first mill. The zone contains two drug stores, two grocery stores, a hardware store, a bakery, a laundry, a shoe repair shop, an electrical appliance store, two paint shops, a farm machinery establishment, a restaurant, a hotel and a bank, open daily. Two general stores, three

gas stations, and a lumber dealer are scattered throughout the village. There is a local newspaper, published weekly, with a paid circulation of 2158.

Interviews were made to ascertain Ayr's trade area, and results showed that its area extended further to the west than in other directions. Eastwards, the trade area is limited because of the village's proximity to Galt and southwards because of Paris. To the west, Drumbo, Plattsville and New Dundee, all small communities 6 to 8 miles away, are the closest centres. Thus Ayr's trading zone extends further into this area than it does to the east. Ayr is located within the larger trading area of Galt. Most of its citizens, when shopping for goods not obtainable in Ayr, such as furniture and most clothing, will shop for them in Galt. However, because Ayr's two grocery stores are both chain stores, there is no price advantage in shopping for groceries in Galt.

There has been a small increase in recent years due to the desire of people to-day to live in small urban centres, commuting daily to nearby cities. Ayr, within easy driving distance of several cities, is ideally situated as a residential village. This function is more dominant in Ayr, than formerly.

The rivers divide Ayr into three sections, with the area to the west having developed strictly as residential.

Throughout the town there does not appear to be any distinct area of strictly lower, middle or upper class housing. The majority of the homes, approximately sixty-three percent, appear to be average. Approximately

Main Commercial Area of Ayr.

One of three feed mills in Ayr.

seventeen per cent, consisting of new modern homes, are above average and the remaining 20% can be considered below average. Most of the last mentioned are old rundown farm houses. There would probably be more first class homes but for the fact that it is almost impossible to procure builders.

Although Ayr is not located on a main highway the main line of the C.P.R. passes through the village. This is of great importance to industry and is a principal reason for the persistence of Ayr's two largest ones. They both have trans-Canada markets and depend on the railway for transporting their products. One of these, the John Watson Mfg.Co. manufactures warehouse trucks and employs twenty persons. Their raw materials are all imported by rail from Toronto, Hamilton, Goderich and Kitchener. The company began operation in Ayr because of the presence of water power. Even today, local water power is generated for use in the plant. Cheap labor in Ayr is a principal factor in the persistence of this industry. The other large industry is that of Best Foods Ltd.,located north of Ayr on the Greenfield Road. This company manufactures mayonnaise, salad dressing, sandwich spreads and margarine. The oils are imported here from Hamilton and the U.S.A. This plant was formerly a flour and cereal mill. During the war it lost its overseas trade and was forced to close down. In 1950, Best Foods took over the plant mainly because it was available and they needed a new factory. Taxes and employment costs are low,which compensate for the somewhat unfavorable location.

Other industries include three Feed and Supply companies which have about twenty employees. All the grain and concentrate is imported, mixed

here, and then sold to the surrounding farm population as feed. The trading area for this product extends to Galt, Blair and Branchton as there is no feed mill in that area, only stores selling feed bought wholesale in Ayr. There appears to be sufficient business in the surrounding agricultural area for the existence of these three companies.

In Ayr, also, are located stockyards, one privately owned, the other owned by the C.P.R., used for the receipt of beef cattle. The cattle are brought in by rail from the west and Manitoulin Island and sold to local farmers. After the cattle are fattened they are usually trucked out from here to Toronto.

Ayr is fortunate in having excellent recreation facilities. It has a new community centre, a large park, both located west of the Nith River. There is no piped water or sewage in the village, but there has never been a shortage of water or any sewage problems. Water easily percolages as ground water through the gravel beds and probably, like Galt, has collected in a channel, from which Ayr draws its supply.

If the present trend of diversification, both residential and industrial, continues, Ayr could increase considerably in population and thus, importance. Although the long distance from markets increases transportation costs, the cheaper labor and lower taxes in Ayr, as compared to the large urban centres, could compensate for this, and thus new industry might be encouraged to locate here.

Branchton and Roseville are two other villages in the township functioning as service centres for the surrounding country-side. Both these centres are only shadows of their former selves, however. Today,

Highway # 97 passing through Roseville. In center of photograph can be seen the general store.

Branchton General Store. Note the neat appearance. This store acts as a local service center.

Roseville contains a modern general store, including a restaurant, three churches, a school and nineteen non-farm homes. The local trading zone of the general store is very small. However, since it is situated on Highway #97 it receives considerable transient trade. Located half-way between Kitchener and Galt, the village folk appear to patronize both cities about equally. Most of the workers commute daily to either Galt or Kitchener.

Branchton is somewhat larger than Roseville. It contains a general store, two auto repair shops, a small refreshment booth, twenty-seven houses and a church. The school is located one-half mile south of the village. The general store specializes in selling quarters of beef bought from local farmers and thus its trading area of about three miles in radius is larger than might be expected. The store also deals in coal and feed from Ayr Feed and Supply. In order that a small general store, situated near a large city, may prosper today, it must have some special source of income. The Branchton store deals in meat, the Roseville store has its transient trade. 50% of Branchton folk are retired. Most of the others commute to Galt and St. George, because there is no industry in the village. However, this centre has expanded a little during the last few years because of cheaper taxes here than in larger urban centres like Galt.

CHAPTER V
CONCLUSION

The land types map of North Dumfries Township presents a varied picture of the landscape, but actually the differences are not as great as they may appear. The kame moraine and till plain have both been modified considerably, the outwash plain has been frequently dissected, and some of the till moraine is not as rugged as other parts of it. These differences are made even less noticeable by the fact that there is only one type of agriculture, general farming, with emphasis on livestock, found throughout the township.

This pattern has resulted from urbanization. Indeed, this factor seems to be the most important in the township and the city of Galt occupies a large area. It serves the township commercially and uses its raw materials. Because of its presence there are only three other centres in the township.

However, Galt has always been somewhat out of the way for the largest urban markets. The Grand River, as a transportation route, has never been of much use. and the railways by passed it for many years. Nevertheless, Galt is now principally an industrial centre. Its commercial function is limited because of the presence, nearby, of other large centres, all having developed along the Grand to make use of its water power facilities. Although, in the past, the commercial function was more important, in the future, the industrial function will become even more dominant. Most of this industrial development will probably occur in the northern section of the city

along the rail lines, the southern section being developed as residential land.

Bibliography

1. Canada Dept. of Resources and Development, Forestry Branch, Native Trees of Canada, Ottawa; King's Printer 1950.
2. Canada. Dominion Bureau of Statistics, Canada Census Reports - 1851 - 1951. Ottawa King's Printer.
3. Chapman, L.J., Putnam, D.F., "The Climate of Southern Ontario", Ontario Research Foundation, Scientific Agriculture 14:8, 1938, p. 401 - 446.
4. Chapman, L.J.,Putnam, D.F.,"The Physiography of Southern Ontario," Toronto; University of Toronto Press, 1951.
5. Chapman, L.J., Putnam, D.F., "The Physiography of South-Western Ontario," Scientific Agriculture 24:3, 1943, p. 101 - 125.
6. Galt Board of Trade, Galt. A Central Location for Industry,Galt 1957.
7. Gilluly, J., Waters, A.C., Woodford, A.O., Principles of Geology, San Francisco: W.H. Freeman & Co. 1953.
8. Halliday, W.E.D., A Forest Classification of Canada, Bulletin 89, Ottawa: Department of Mines and Resources, Parks and Forest Branch Forest Service 1937.
9. Hamilton R.S. - Early History of Galt 1816 - 1866. ed. by Osbourne and Taylor, Owen Sound; Richardson, Bond and Wright,1956.
10. Lobeck, A.K., Geomorphology. New York and London: The McGraw-Hill Book Company, Inc., 1939.
11. Ontario Agricultural College, Soils Department,
    Soil Survey of Perth County, 1952.
    Soil Survey of Huron County, 1952.
    Soil Survey of Prince Edward County, 1948.

12. Ontario Agricultural College, Soils Department, Soil Map of Waterloo County.

13. Ontario Department of Planning and Development, Conservation Branch, Nith Valley Conservation Report, Toronto, 1951.

14. Ontario Department of Planning and Development, River Valley Development in Southern Ontario. Toronto, 1945.

15. Putnam, D.F. et. al., Canadian Regions Toronto: J.M. Dent & Son (Canada) Limited, 1952.

16. Taylor, A.W. - Our Yesterdays - A History of the Township of North Dumfries, 1816 - 1952, Galt Printers, 1952.

17. Thornbury, W.D., Principles of Geomorphology, New York: John Wiley and Sons, Inc., 1954.

18. Thornthwaite, C.W., "An Approach Toward a Rational Classification of Climate". The American Geographical Society, The Geographical Review, Vol. XXXVIII, No. 1, 1948.

Appendix A

THORNTHWAITE TABLES FOR GALT...

(1)

	J	F	M	A	M	J	J	A	S	O	N	D
Potential Evapotranspiration	-	-	-	3.0	7.3	11.3	13.3	11.5	7.9	4.0	0.7	-
Precipitation	6.3	5.0	5.1	6.2	7.2	7.0	8.0	7.4	6.7	6.2	6.2	5.4
Storage	10.0	10.0	10.0	10.0	9.9	5.6	0.3	-	-	2.2	7.7	10.0
Actual Evapo.	-	-	-	3.0	7.3	11.3	13.3	7.7	6.7	4.5	.7	-
Surplus	6.3	5.0	5.1	3.2	-	-	-	-	-	-	-	3.1
Deficiency								3.8	1.2			

(2) Moisture Index - This is gained by comparing the P.E. with precipitation.

Moisture Index = 42.9;
Climatic Type = B_2 Humid

(3) Thermal Efficiency Index

Thermal Efficiency Index - 59.0;
Climatic Type - B, Mesothermal.

(4) Index of Aridity - This is gained by comparing water deficiency with water need and indicates seasonal variations in the area.

Index - 8.5
Type - r: Little or no water deficiency.

(5) Summer Concentration

Annual Potential Evapotranspiration / Thermal Efficiency / Water Need
- 59.0 centimeters.

June / July / Aug. - 36.1 centimeters

Summer Concentration of P.E. - 61.2%; Type - b_2^1

(6) Climatic Type of Galt

$B_2 B_1^1 r b_2^1$

APPENDIX B.

POPULATION OF N. DUMFRIES TOWNSHIP.

National Origin	1851	1861	1871	1881	1891	1901	1911	1921	1931	1941	1951
Total	3476	4161	3951	3848	2516	2164	2095	2146	2479	2996	4178
English & Welsh	183	178	429	585	-	338	485	625	832	1072	-
Scottish	1307	1227	2856	2429	-	1345	1051	960	923	941	-
Irish	146	142	260	294	-	124	162	160	177	248	-
German & Dutch	73	90	283	445	-	342	380	338	415	489	-
French	-	1	16	15	-	3	-	21	32	55	-
Swiss	1	-	74	50	-	1	4	-	-	-	-
Italian	-	-	-	9	-	-	-	4	-	1	-
Scandinavian	-	-	-	-	-	2	1	1	2	4	-
Eastern European	-	-	-	-	-	2	-	11	69	119	-
Jewish	-	-	-	-	-	-	7	5	-	9	-
African	-	7	15	3	-	1	-	1	-	-	-
Native Indian [1]	-	-	-	7	-	-	-	10	-	11	-
Native Canadians & Americans (non-Indians)	1752	2513	-	-	-	-	-	-	-	-	-
Others	14	3	18	11	-	6	5	10	29	47	-

1. Note different classification used in 1851 - 61.

APPENDIX C.

FIELD PRODUCTS OF N. DUMFRIES TOWNSHIP.

Crops	1851	1861	1871	1881	1891	1911	1921	1941	1951
Spring Wheat	115,390 bu.	12,075 bu.	542 bu.	40 bu.	752 bu.	-	10 ac.	4,080 ac.	3,951 ac.
Winter Wheat		177,530 bu.	88,846 bu.	124,117 bu.	120,267 bu.	6,370 ac.	4,121 ac.		
Barley	5,235 bu.	15,490 bu.	51,409 bu.	57,975 bu.	105,944 bu.	1,334 ac.	941 ac.	602 ac.	276 ac.
Oats	49,232 bu.	63,472 bu.	70,829 bu.	95,090 bu.	96,955 bu.	5,490 ac.	6,575 ac.	4,766 ac.	5,297 ac.
Rye	1,596 bu.	2,119 bu.	554 bu.	1,784 bu.	655 bu.	92 ac.	556 ac.	187 ac.	191 ac.
Buckwheat	268 bu.	229 bu.	40 bu.	230 bu.	139 bu.	68 ac.	129 ac.	-	-
Potatoes	36,111 bu.	83,550 bu.	71,542 bu.	56,671 bu.	56,938 bu.	358 ac.	454 ac.	278 ac.	74 ac.
Peas	9,795 bu.	23,854 bu.	32,557 bu.	25,211 bu.	42,226 bu.	596 ac.	43 ac.	-	-
Beans	-	345 bu.	101 bu.		81 bu.	2 ac.	1 ac.	-	-
Turnips	52,270 bu.	256,162 bu.	435,119 bu.	541,237 bu.	452,213 bu.	537 ac.	512 ac.	610 ac.	-
Other Roots	115 bu.	71,887 bu.	25,233 bu.	37,481 bu.		369 ac.	168 ac.	-	193 ac.
Corn	4,161 bu.	1,960 bu.	3,577 bu.	11,497 bu.	3,479 bu.	908 ac.	1,351 ac.	-	-
Hay	4,564 tons	4,208 tons	5,480 ac.	4,599 ac.	5,852 ac.	6,108 ac.	6,482 ac.	7,047 ac.	6,839 ac.
Other Forage Crops	407 bu.	359 bu.	652 bu.	206 bu.	15 bu.	474 ac.	40 ac.	1,113 ac.	1,120 ac.
Mixed Grain	-	-	-	-	-	749 ac.	1,389 ac.	3,479 ac.	2,286 ac.
Other Field Crops	-	-	-	-	-	-	-	15 ac.	48 ac.
Total Crops	9,623 ac.	18,680 ac.	27,395 ac.	26,439 ac.			22,772 ac.	22,177 ac.	20,273 ac.

APPENDIX D.

LIVESTOCK IN NORTH DUMFRIES TOWNSHIP.

LIVESTOCK	1851	1861	1891	1941	1951
Horses	1156	1543	2396	1391	500
Oxen	1066	254	23	-	-
Milch Cows	1268	1778	1949	2383	3293
Beef Cattle	-	-	-	432	594
Calves & Heifers	1047	1847	-	740	-
Other Cattle	-	-	2591	2417	2162
Sheep	7303	7930	2467	735	729
Swine	2413	2236	2923	4630	4803
Hens & Chicks	-	-	24,797	57,721	15,716
Turkeys & Other Fowl	-	-	1,259	1,188	33,965

APPENDIX E.

SIZE OF FARMS

1851			1951		
10 acres	-	26 farms	10 acres	-	14 farms
10-20 "	-	3 "	10-69 "	-	35 "
20-50 "	-	39 "	70-129 "	-	100 "
50-100 "	-	124 "	130-179 "	-	63 "
100-200 "	-	123 "	180-239 "	-	45 "
200 "	-	27 "	240-399 "	-	24 "
			400-559 "	-	2 "
			500-759 "	-	2 "
Total	-	342 farms	Total		285 farms

CONDITION OF OCCUPIED FARMLAND

	1851	1951
Total Area	40,489 ac.	39,322 acres
Under cultivation	26,319 "	30,158 "
Under crops	9,916 "	21,592 "
Pasture	16,403 "	8,566 "
Wood and Wild land	14,170 "	9,164 "

APPENDIX F.

INDUSTRIES IN GALT - 1857

1 Axe Factory

2 Woollen Mills

2 Chair Factories

4 Sash Factories

1 Stove and Shingle Factory

4 Foundries

3 Machine Shops

1 Distillery

1 Malt House

1 Brewery

3 Carriage Factories

2 Weekly Papers

APPENDIX G.

General Types of Industries - Galt 1955.

Industry	No.	No. employed.
Iron & Steel	43	3090
Other Metal	6	301
Textile	8	1413
Leather	6	725
Plastic	4	458
Wood-using	8	216
Food	8	147
Chemical	2	9
Paper	1	29
Miscellaneous	5	50
	91	6438