WILBERFORCE TOWNSHIP

A REGIONAL STUDY OF LAND USE AND SETTLEMENT

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A REGIONAL STUDY OF LAND USE AND SETTLEMENT

A Thesis

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L. G. Reeds.

by

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TABLE OF CONTENTS

TABLE OF CONTENTS (CONT.)

LIST OF ILLUSTRATIONS

LIST OF ILLUSTRATIONS (CONT.)

LIST OF FIGURES

TABLES

INTRODUCTION

Man has always sought a means of livelihood from his natural environment. To some, the environment has provided rich opportunities while to others, little has been gained from it. Land, which is the home of man, will always present natural obstacles to human attempts to secure a living. Mankind with his varying levels of cultural development has devised methods of overcoming some of the obstacles in his natural environment and has, therefore, turned barriers into resources in using the land to its greatest advantage.

Geography, with its broad examination of human and physical interrelationships, concerns itself with the following study and provides the systematic approach required to deal with such an investigation.

The township of Wilberforce in northeastern Ontario provides the area of study. It will be examined, first, from a purely physical point of view, with attention being paid to rock structures, physiography and drainage, climate, natural vegetation and soil development. From the developed physical scene will come the more inclusive selection of physically homogeneous land types on which a more critical classification, examination and discussion of present agricultural land use will be based. The historical development of settlement and agriculture has also been important in evolving the present day land use pattern and some emphasis will be placed upon this aspect of the study. Non-agricultural activity as

well as urban development will also be discussed. Cartographic and photographic illustrations are included to give a clear picture and understanding of the various ideas set forth by the writer.

The aim of this thesis, therefore, is to present a systematic investigation of the underlying factors, both physical and cultural, which have influenced the existing pattern of economic development in a specific area of study such as Wilberforce Township.

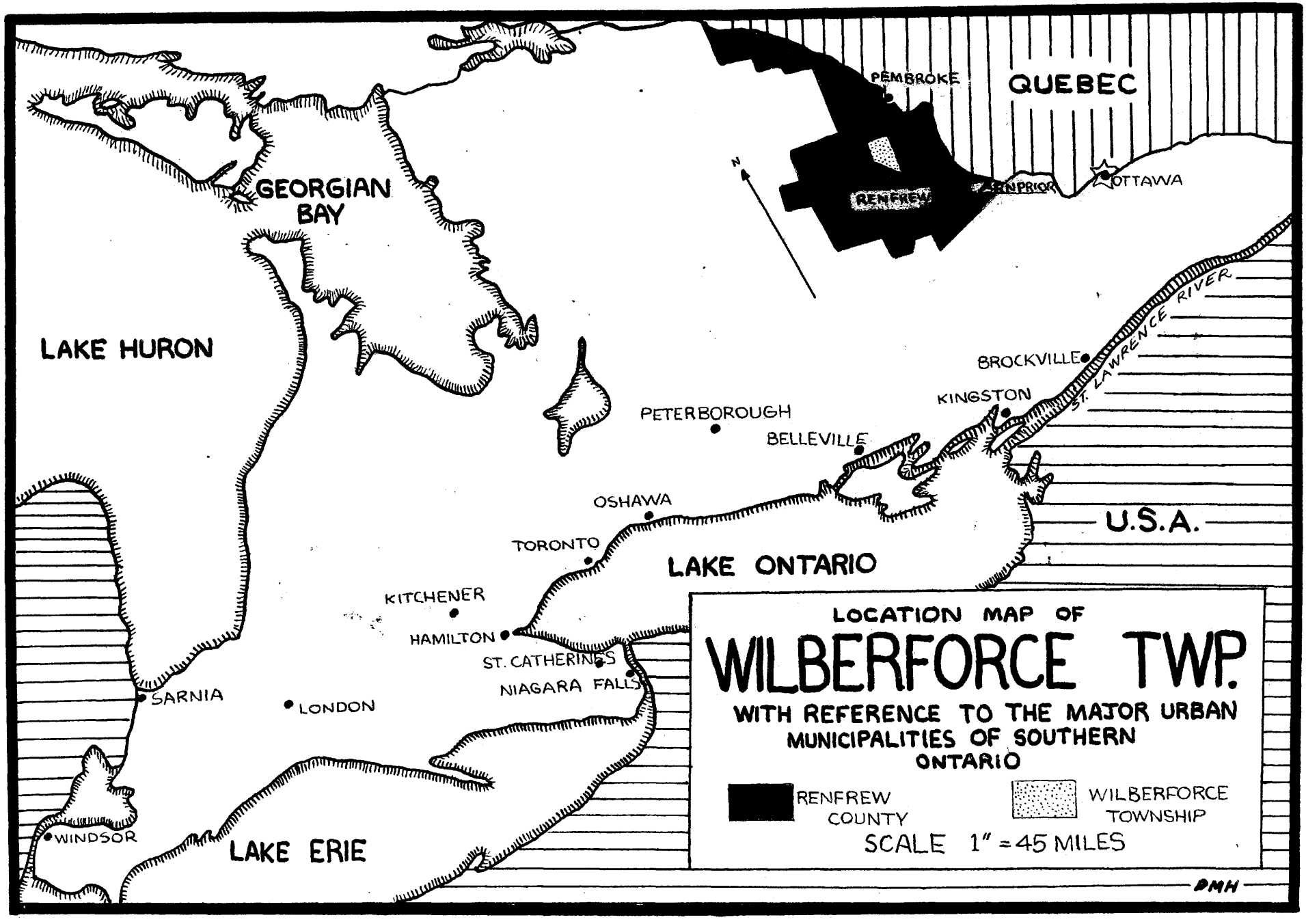
PEMBROKE
QUEBEC
GEORGIAN BAY
RENFREW
ARNPRIOR
OTTAWA
N
LAKE HURON
ST. LAWRENCE RIVER
BROCKVILLE
KINGSTON
PETERBOROUGH
BELLEVILLE
OSHAWA
U.S.A.
TORONTO
LAKE ONTARIO
KITCHENER
HAMILTON
ST. CATHERINES
NIAGARA FALLS
SARNIA
LONDON
WINDSOR
LAKE ERIE
LOCATION MAP OF
WILBERFORCE TWP.
WITH REFERENCE TO THE MAJOR URBAN MUNICIPALITIES OF SOUTHERN ONTARIO
RENFREW COUNTY
WILBERFORCE TOWNSHIP
SCALE 1" = 45 MILES
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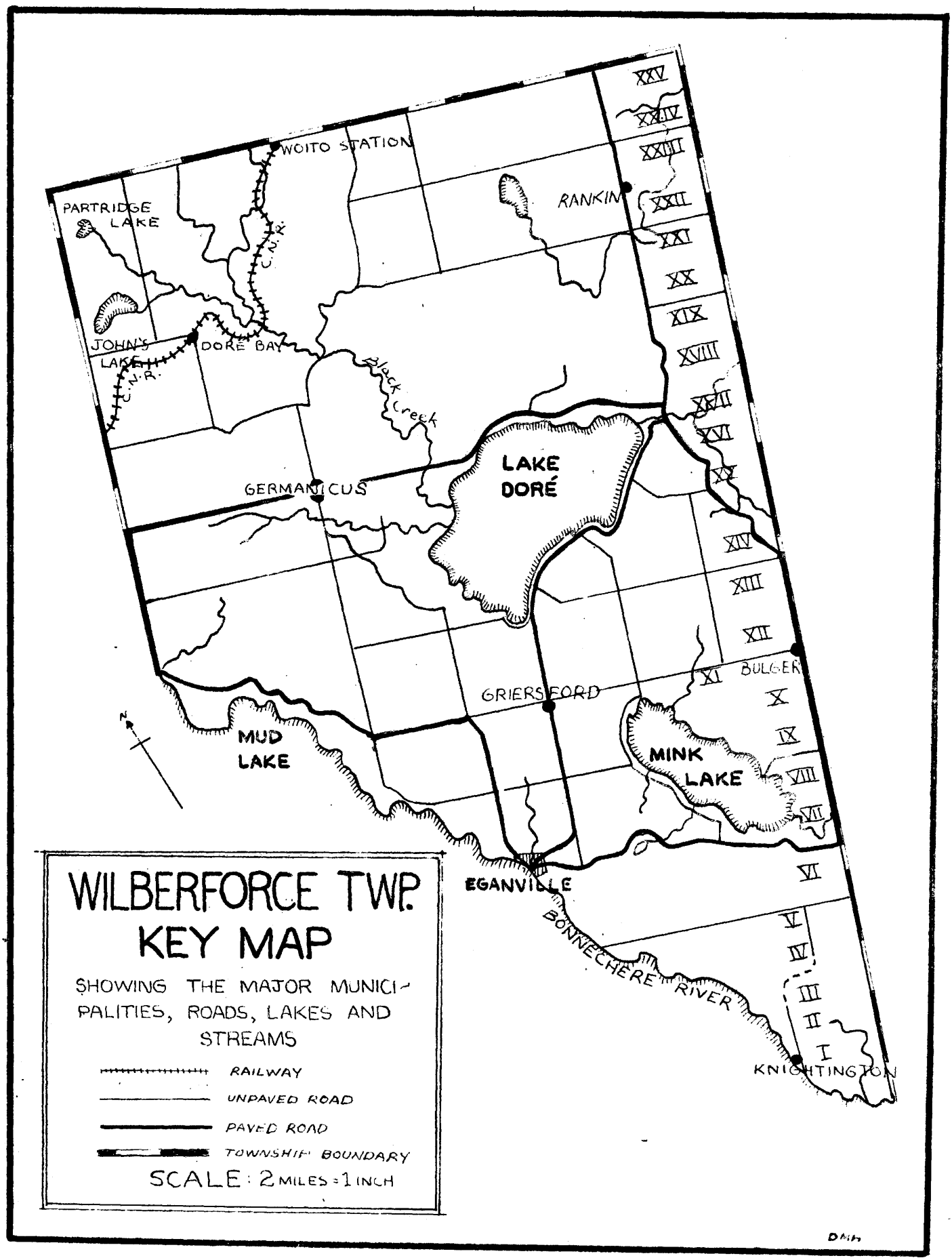
FIGURE 2


WOITO STATION
PARTRIDGE LAKE
C.N.R.
RANKIN
JOHN'S LAKE
DORÉ BAY
C.N.R.
Black Creek
LAKE DORÉ
GERMANICUS
GRIERSFORD
BULGER
MUD LAKE
MINK LAKE
EGANVILLE
BONNECHERE RIVER
KNIGHTINGTON
XXV
XXIV
XXIII
XXII
XXI
XX
XIX
XVIII
XVII
XVI
XV
XIV
XIII
XII
XI
X
IX
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V
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N
WILBERFORCE TWP.
KEY MAP
SHOWING THE MAJOR MUNICIPALITIES, ROADS, LAKES AND STREAMS
RAILWAY
UNPAVED ROAD
PAVED ROAD
TOWNSHIP BOUNDARY
SCALE: 2 MILES = 1 INCH
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CHAPTER I

THE PHYSICAL GEOGRAPHY OF WILBERFORCE TOWNSHIP

Location

Wilberforce Township is to be found near the intersection of the 77th meridian of west longitude with the 45th parallel of north latitude. A political subdivision within the county of Renfrew, Wilberforce Township is situated in east central Ontario some 95 miles northwest of Ottawa and 12 miles southwest of Pembroke, both of which are on the Ottawa River (Fig. 1).

Areally, the township occupies 60,407 acres which include three lakes. Of the total acreage, 25,865 acres are cleared of natural vegetation while the remainder is still under forest cover.

Bedrock Geology

Wilberforce Township lies within a structurally depressed and topographically low belt about 35 miles in width known as the "Ottawa-Bonnechere Graben". (Kay, 1942, pp. 585-642). Paleozoic sediments, such as Ordovician Trenton and Black River limestones (Illus. 1), lie within this belt as infaulted outliers. Many exposures of these rocks may be seen, throughout the area, interspersed with the hard, crystalline Precambrian granites and gneisses (Illus. 2 and 7).

There is conclusive evidence that the distribution of Paleozoic sediments in Wilberforce Township is directly related to a system of faults (Fig. 3). The Doré fault, which parallels the Snake River in its course

Illus. 1: Exposures of flat lying Ordovician (Trenton) limestone along the north shore of the Bonnechere River, south of Eganville.

Illus. 2: An outcrop of banded orthogneiss of Precambrian origin. Note the contorted foliations on the rock surface and the grooves caused by differential weathering.

at the northeastern tip of Lake Doré, is the northern border of a vast area of underlying Ordovician sediments. These rocks extend as far south as Mink Lake and eastward into neighbouring Bromley Township. The Bonnechere outlier, covering an area of about 20 square miles, extends in a narrow linear belt along the Bonnechere River from Mud Lake to the southern extremity of the township (Fig. 3). These sediments have a general northward dip toward a system of faults along their northern border. The Eganville fault continues westward beyond the township boundary to merge with the Cochrane cross fault. At this point of intersection the Cochrane fault becomes insignificant (Fig. 3).

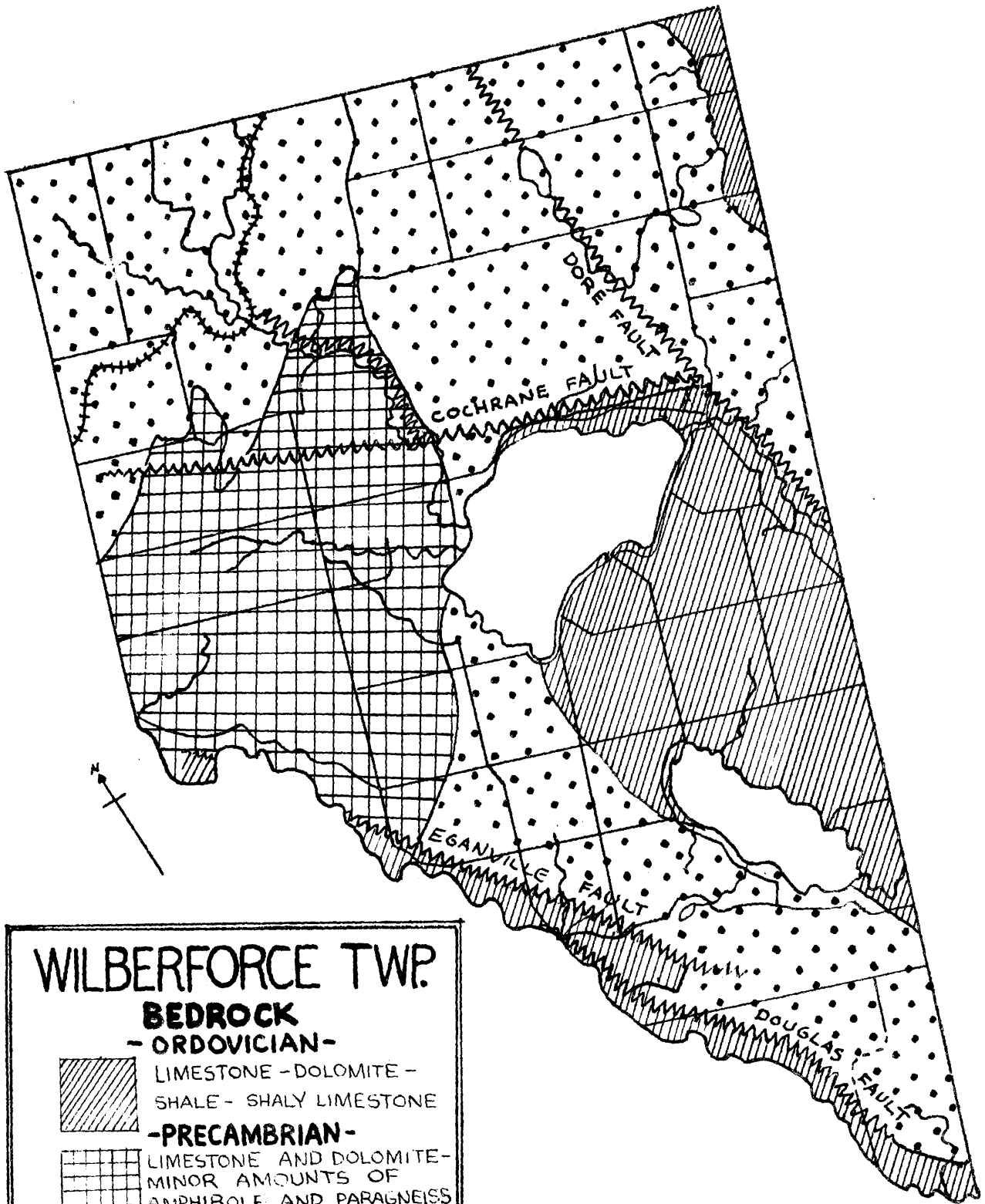
The nature of the bedrock in Wilberforce Township assumes much interest inasmuch as its water holding capacity is concerned. Ground water is mainly derived from rainfall and snow and its availability may show periodic fluctuations owing to variations in rainfall. Information as to the supply of ground water is limited in the township. However from the few well borings that have been made, a general picture of the main characteristics of ground water supply in the area may be presented. Table I is compiled from data obtained by the Department of Mines and Technical Surveys.

TABLE I

SPECIMEN WELL BORINGS IN WILBERFORCE TOWNSHIP

NO.	LOCATION	DEPTH	LEVEL OF WATER	YIELD	AQUIFER
1.	Lot 20, Con. 8	280'	17' from surface	8 gal/min	Trenton-Black River Limestone
2.	Lot 11, Con. 13	64'	16' from surface	5 gal/min	" " "
3.	Lot 12, Con. 18	96'	3' from surface	15 gal/min	" " "
4.	Lot 26, Con. 18	149'	48' from surface	5 gal/min	" " "

FIGURE 3



(COURTESY ONT. DEPT. OF MINES)

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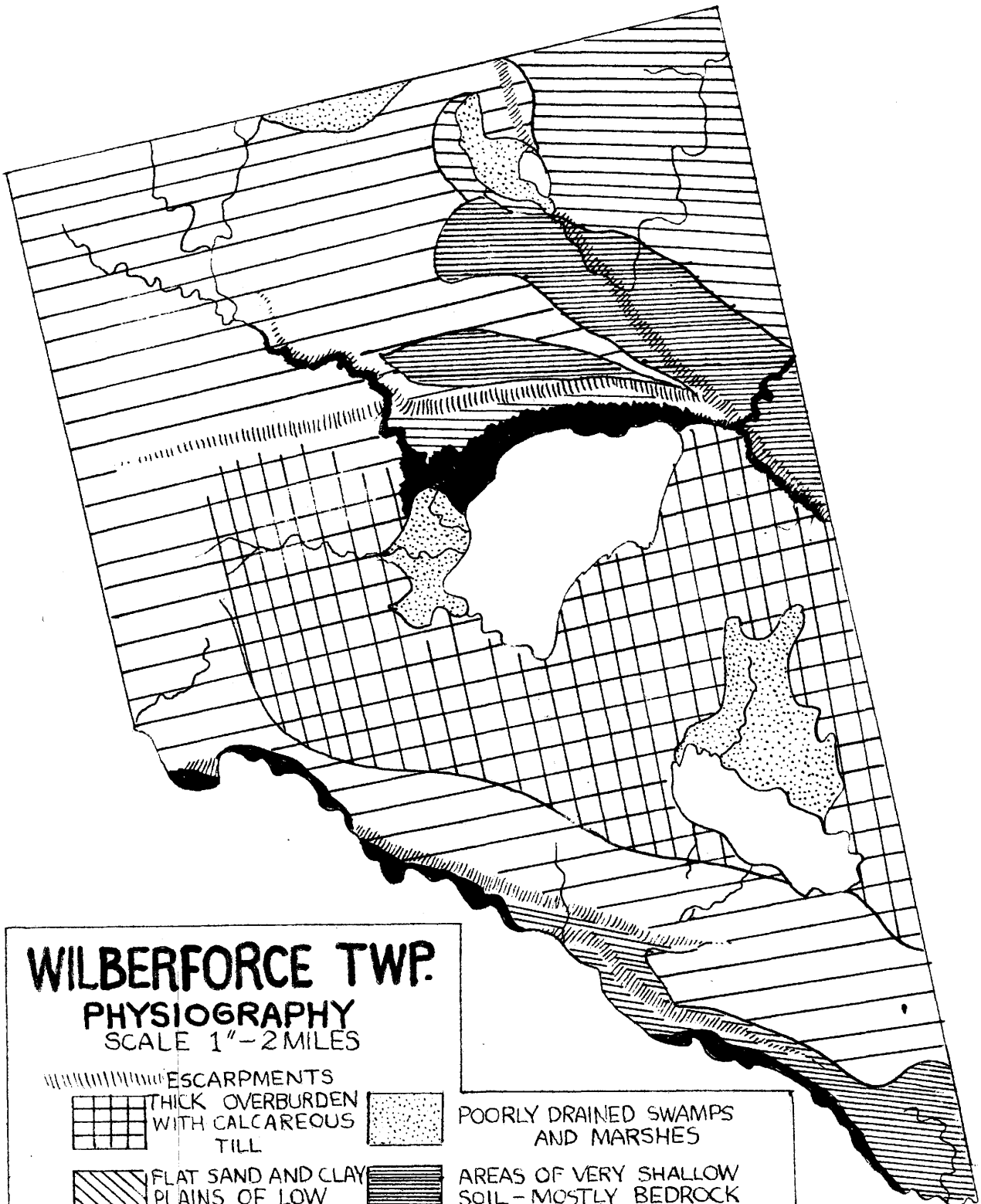
From this example, it can be seen that limestone predominates as the main type of rock for water storage. Granite is an extremely poor source of water, those areas underlain by it drawing their water supply from the nearby streams, ponds and lakes.

Physiography

The system of faults which separates the hard, Precambrian granites and gneisses from the soft, Ordovician limestones is believed to be of Ordovician age (Kay, 1942, p. 625). The present relief of the area has been the result of differential erosion which has left a scarp at the edge of the more resistant Precambrian rock. Thus a series of imposing, south facing, fault-line scarps follows the line of faults already noted in the foregoing section (Figs. 3 and 4).

The numerous elements which gave rise to the differential erosion of the scarps and the present arrangement of other surface features on the landscape deserve special attention. During the Pleistocene, the area in which Wilberforce Township lies was subjected to extensive glaciation. The deposits of the last ice sheet (Wisconsin) and its melt water streams are the main concern in this study. As the thick ice masses retreated northward the areas of land subjected to their weight were greatly depressed. Prior to the coming of the ice, elevations may have been in excess of those now found but the weight and resultant pressure of the ice caused subsidence which invited the invasion of the Champlain Sea (Coleman, 1901, p. 132). The marine waters, which extended as far north as Lake Temiskaming, covered much of the area to a depth of 200-300 feet. As the burden of the ice became gradually less, a series of uplifts raised the land mass above sea level and marked the beginning of the rivers which

FIGURE 4


WILBERFORCE TWP.
PHYSIOGRAPHY
SCALE 1"-2 MILES
ESCARPMENTS
THICK OVERBURDEN WITH CALCAREOUS TILL
FLAT SAND AND CLAY PLAINS OF LOW ELEVATION
UNDIFFERENTIATED ROCK KNOBS AND SAND
POORLY DRAINED SWAMPS AND MARSHES
AREAS OF VERY SHALLOW SOIL - MOSTLY BEDROCK AND BOULDER OUTCROPS
ALLUVIAL BOTTOMLAND
DMH

then commenced the work of entrenching themselves into their present valleys. The nature of the drainage pattern in the township, which trends in a northwest to southeast direction, suggests that this may have been a glacially controlled phenomenon. The main drainage systems, namely Black Creek, the Snake River and the larger Bonnechere River, can be associated with the pattern of fault-line scarps already discussed. Their location along the base of the scarps seems to indicate that drainage was originally directed along structural weaknesses associated with the fault line movements. If this is so, Mud Lake may have been formed by the accumulation of drift materials associated with fluvioglacial action. The other lakes in the township, Mink Lake and Lake Doré are the result of glacial melting. However their present positions may be due, in part, to structural weaknesses of the underlying bedrock, the permeability of the rock and the extent to which fluvioglacial deposition had progressed when the original entrenchment of streams began.

Two very prominent terraces are to be seen on the southeast shore of Lake Doré bordering Highway 41. These may indicate different lake levels rather than river terraces resulting from down-cutting action since definite gradation of boulder size, in well sorted sequence, from the present shoreline up to the terraces may be seen. More exposures at the northeastern tip of Lake Doré reveal water laid sediments in roughly stratified arrangement suggesting beach deposits associated with the present lake. Along the north shore of Lake Doré, thick deposits of fine alluvium over beds of coarse sand indicate that, even to-day, the present shoreline of the lake is subject to periodic fluctuation (Fig. 4).

Between Mud Lake and Lake Doré exposures of the overburden show

Illus. 3 and 4: An exposure of a morainic deposit of glacially transported limestone till fragments. A common surface deposit in Wilberforce Township.

Illus. 5 and 6: These photographs show exposures of finely bedded sand associated with ancient beach deposits. The northeast sectors of the township display the best examples of this material.

Illus. 7: Exposures of granite gneiss bedrock as seen from a cutting along the highway northeast of Lake Dore.

Illus. 8: A field strewn with glacially deposited limestone fragments in the southern tip of the township.

sand stratafication of coarse, medium and fine grains lying on top of large granite boulders. The boulders, which appear to have been ice rafted, could have been part of the Bonnechere flood plain. However the possibility that Mud Lake, Lake Doré and Golden Lake all formed part of a much larger water body seems more likely. Uplift coupled with the deposition of glacial debris could, therefore, account for the existing separation of the lakes.

Many of the landforms of glacial and fluvioglacial origin have undergone extensive alteration by the invading sea. Clay deposits as thick as 500 feet were deposited in the northeastern sections of the township. These lands, which are presently below the 500 foot contour level, were submerged for a period of time sufficient to allow such a depth of clay to accumulate. When uplift did occur, those areas of higher elevation which had undergone only partial submergence, underwent the effects of wave action. As a result, there are many exposures throughout the area of finely stratified sand, gravel and boulders which suggest the remnants of ancient beaches. Much fine sand has been gathered in ridges of varying height which often appear as parallel steps. Examples are to be seen north of Green Lake and at a roadside cutting west of Griersford (Illus. 5 and 6). Planing, by wave action, of kames and eskers has added to the morphological complexity of these present day surface deposits. Drumlins, drumlinoidal hills, kames and eskers have all undergone considerable modification by wave action and the glacial drift which originally composed them has been spread about in disorderly fashion (Illus. 3 and 4).

Climate

The climate of the area in which Wilberforce Township lies has been

classified by Thornthwaite (1948) as being a humid microthermal type with large summer concentration of rainfall and low water deficiency. Within this broad climatic zone there are regional variations caused by local circumstances which greatly affect the climate.

Situated at 45° north latitude Wilberforce lies within an area which is directly in the path of the westerlies and a majority of the cyclonic storms which cross the continent from west to east. The passage of such storms produces a characteristic type of climate which is noted for its extreme changeability. The location of the township within a comparatively narrow structural depression flanked by the rough highlands of the Precambrian Shield is also important in its effects upon the climate. Putnam and Chapman (1938) have, therefore, placed Wilberforce in a climatic zone designated as the "Renfrew Region".

TABLE II

CLIMATIC STATISTICS FOR THE RENFREW REGION

Mean Annual Temperature	40°F
Extreme Low Temperature	-40°F
Average Length of Frost-Free Days	127 days
Average Annual Snowfall	100"
Mean Winter Temperature	13°F
Extreme High Temperature	103°F
Beginning of Growing Season	Apr. 25
Average Rainfall (Apr. 1 - Sept. 30)	12.3"
Mean Spring Temperature	39°F
Average Daily Temperature Range	22°F
End of Growing Season	Oct. 23
Average Summer Rainfall (June, July, Aug.)	6.3"
Mean Summer Temperature	65°F
Average Date of the Last Spring Frost	May 24
Average Length of the Growing Season	181 days
Mean Fall Temperature	44°F
Average Date of the First Fall Frost	Sept. 20
Average Annual Precipitation	28.9"
Percentage of Sunshine During the Growing Season	52%

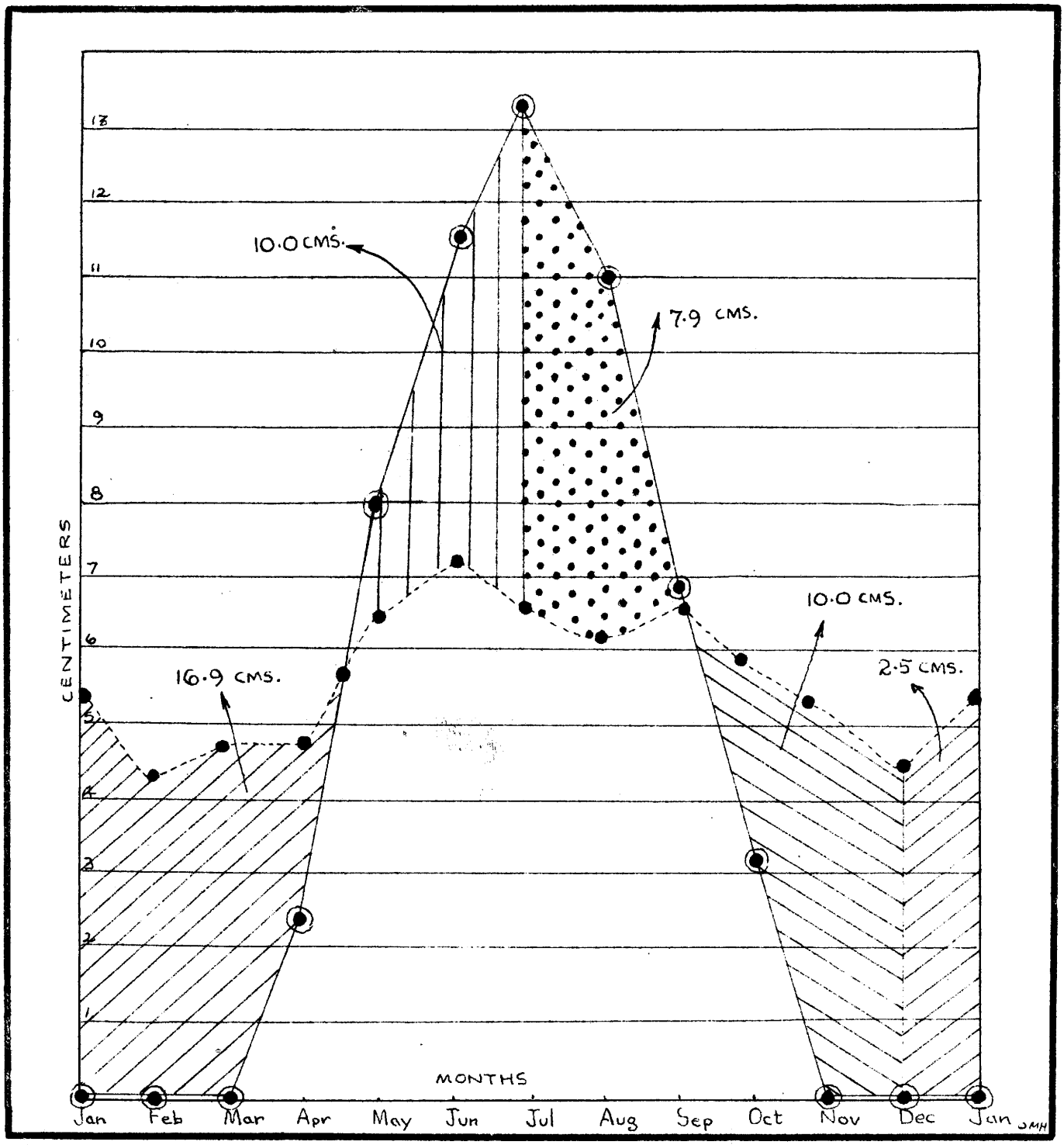
In a study such as this, a more intensive and exacting approach to the significant features of climate must be made. This can be accomplished by studying the effectiveness of climate on the land and its drainage patterns, hydrological regimes and soil forming processes. Since all of these are very much dependant upon water deficiencies and surpluses much can be learned about the role that climate plays in the physical setting of the township.

The principles set forth by Thornthwaite (1948, pp. 55-94) seem most appropriate for our use since, in his treatment, "vegetation is regarded as a physical mechanism by which water is transported from the soil to the atmosphere; it being the machinery of evaporation just as the cloud is the machinery of precipitation" (Thornthwaite, 1948, p. 56). Evapotranspiration or combined evaporation from the soil surface and transpiration of plant moisture to the atmosphere, is a basic consideration in this approach, giving as it does, both heat and moisture factors.

From climatic statistics compiled at the Renfrew weather station, potential evapotranspiration (P.E.) may be calculated by using specialized procedures (Thornthwaite, 1948, p. 93). The figure arrived at gives the amount of moisture which can be lost to the atmosphere, in one year through transpiration and evaporation if water is always freely available. Potential evapotranspiration, in this case, is 56.2 centimeters per annum.

Once the P.E. figure has been calculated it may be compared with the total annual precipitation figure. Thence the amounts and monthly distribution of water surpluses and deficiencies, which will develop during an average year, may be discerned (Fig. 5). We can regard the soil, in this case, as resembling a storage reservoir that may be called upon as

FIGURE 5



MOISTURE BALANCE AT RENFREW

PRECIPITATION — POTENTIAL EVAPOTRANSPIRATION

SOIL MOISTURE UTILIZATION

SOIL MOISTURE RECHARGE

MOISTURE DEFICIENCY

MOISTURE SURPLUS

moisture lasts. The field capacity of the soil is arbitrarily assumed to be 10 cms. and any moisture surplus to this figure will be dissipated both by replenishment of the water table and by runoff. Since heat is of prime importance in evapotranspiration storage will be at a maximum during the cooler months of the year (December to March). During these months moisture becomes surplus.

TABLE III

MOISTURE SURPLUS[1] IN THE RENFREW REGION (CMS.)

	DEC	JAN	FEB	MAR
Precipitation	4.6	5.3	4.3	4.8
Potential Evapotranspiration	0	0	0	0
Storage	10.0	10.0	10.0	10.0
Actual Evapotranspiration	0	0	0	0
Surplus	2.5	5.3	4.3	4.8

In April, with the extended day length and the resultant increase in atmospheric heat, evapotranspiration begins to make itself felt. Since P.E. is less than the precipitation a surplus still exists, in spring, and the soil remains at field capacity. In May and June P.E. is found to equal actual evapotranspiration and, thus, there is no moisture deficiency or surplus.

[1]Note: It will be noted that the surplus figure for December is less than the actual precipitation figure. Since field capacity had not been attained in November (only 7.9 cms.), 2.1 cms. of the 4.6 cms. precipitation in December brought storage to full capacity while the remaining 2.5 cms. were surplus.

TABLE IV

MOISTURE DEFICIENCY IN THE RENFREW REGION (CMS.)

	JUL	AUG	SEPT
Precipitation	6.6	6.1	6.6
Potential Evapotranspiration	13.3	11.0	6.9
Storage	4.0	0	0
Storage Change	4.0	0	0
Actual Evapotranspiration	10.6	6.1	6.6
Deficiency	2.7	4.9	0.3

As can be seen from the preceding table storage is exhausted very quickly in the warm summer months. When P.E. requirements exceed precipitation as in August and September, no stored supplies of moisture are left to be called upon. Potential evapotranspiration exceeds actual evapotranspiration implying a moisture deficiency. During October P.E. is less than precipitation and, consequently some moisture goes back into storage. Since field capacity has not been reached neither a surplus nor a deficiency of moisture occurs. In November, with the advent of cold weather, no P.E. is recorded. Precipitation for this month may be added to the already increasing amount of moisture in storage.

From the foregoing analysis of the effectiveness of climate it can be seen that a definite deficiency of moisture is experienced in at least the three warmest months of the year. Although this factor is subject to fluctuation as, indeed, are the statistics which make this information available, it is possible to see that deficiencies of moisture do occur in an area like Wilberforce which is ostensibly humid.

Vegetation

Wilberforce Township lies within what is commonly called the Great

Lakes - St. Lawrence forest region (Sharpe and Brodie, 1931). This region is classified as such according to a broad uniformity of tree species associations resulting from a combination of local climatic conditions, soil and rock formations and general topography influencing soil moisture percolation, drainage and runoff.

In this region, white and red pine reached their maximum development before extensive lumbering and fire came to remove a large portion of the original forest cover. In spite of the previous dominance of these species and the presence of other conifers, the general character is that of a mixed forest. The dominant or competitive association is formed by hard maple, yellow birch, hemlock and red and white pine. Jack pine, poplar and white birch are the result of re-growth in areas which have either been cleared or burned.

While elevation cannot be considered the only controlling influence on the general forest association encountered in the township and its environs, such a criterion does serve to locate the associations and to describe the gradual changes in forest composition from higher to lower levels. Within the areas of higher elevations the tolerant hardwoods such as hard maple and yellow birch predominate, with scattered patches of white pine and hemlock occurring throughout the stand. As the lower elevations are approached, the forest composition gradually changes to one of a higher coniferous content, largely through an increase in white and red pine. In Wilberforce Township the large areas of upland above the scarps, contain shallow stony soils often dotted with large granitic outcrops. Here only a rough scrub growth is supported whereas on the deeper soils mixed hardwoods and conifers still prevail. Extreme swamp sites and poorly drained

lands in the township support cedar, spruce, tamarack and balsam fir in various proportions. Bordering swamps and lakes contain scattered stands of hemlock. On the deep loamy slopes hardwoods predominate being intermixed with white pine, hemlock and white spruce. It is in these forest associations that the best developed softwood trees, both in size and quality, are found. Forests of the uplands, which are dependant upon soil depth and moisture, consist of either of the two hardwood mixtures or pure pine stands.

The foregoing is a picture of the original forest which, as a result of fire ravages, lumbering and agriculture now occupies only about 50% of the township acreage. The cedar and spruce have been largely removed from the swamps and the white pine and hemlock from the mixed-hardwood and pure coniferous associations (Sharpe and Brodie, 1931, p. 32). As a result of fire well over one-half of the township's forests are now composed of the poplar-birch association. Such stands, for the most part, have replaced former pineries and occur on the thinner soils.

Soils[1]

Wilberforce Township lies in that portion of eastern Ontario which is on the fringe of the great podsol soil zone (Putnam and Chapman, 1937). This is exemplified by the extensive occurrence of grey-brown podsolic soils along with true podsols of weak development.

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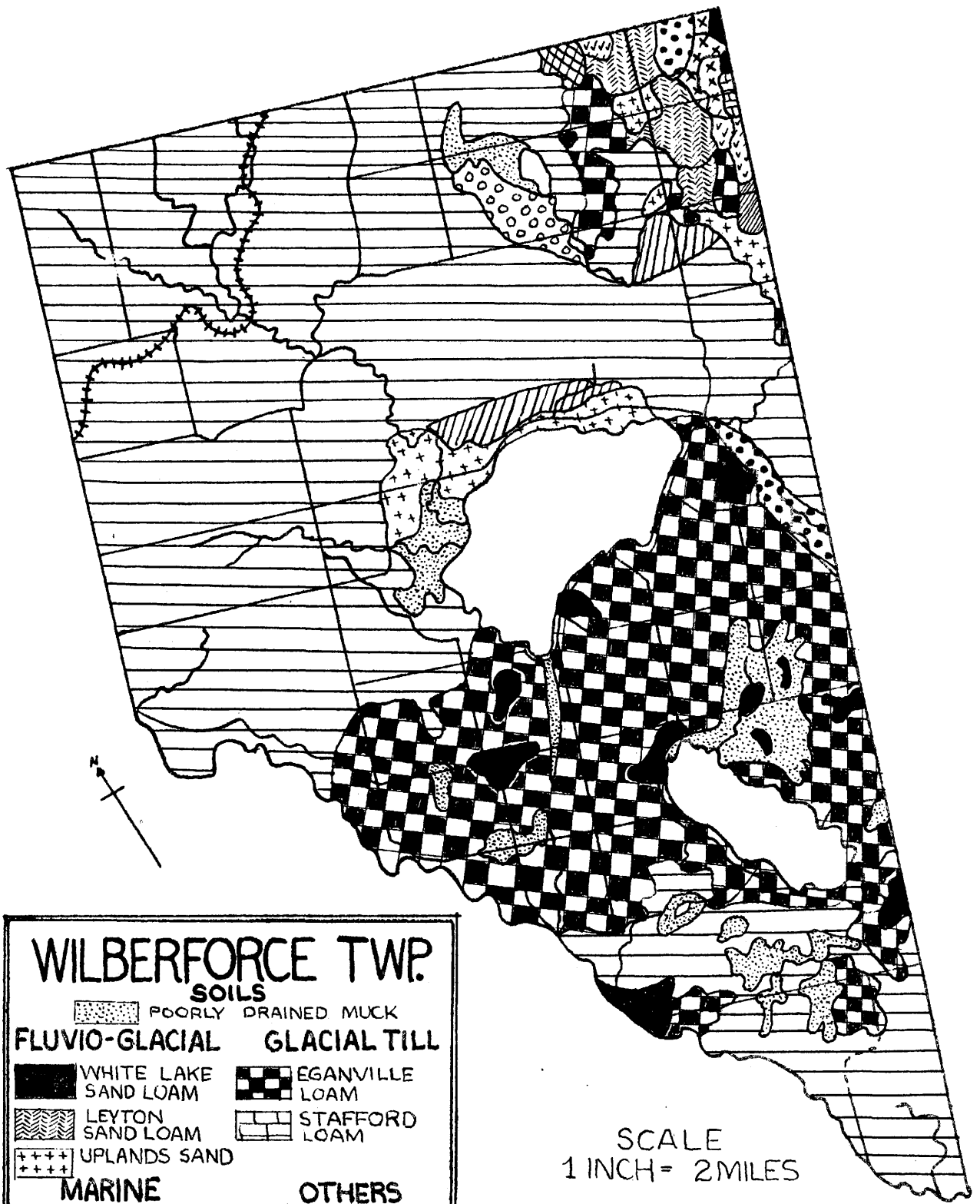
[1]Material for this section was obtained from the Soils Department of the Ontario Agricultural College at Guelph, Ontario. Most of the data which is, as yet, not published was largely supplemented with observations made in the field.

FIGURE 6



(COURTESY O.A.C. SOILS DEPT.)

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The various types of soil to be found in Wilberforce are chiefly the result of development within a specific environment. The chief features of the environment have already been discussed in some detail; however it would be well to note that the cold winter climate, the nature of the vegetation cover and the complexity of the surface materials are important in the formation of existing soil types and their respective distributions (Fig. 6).

In the physiographic region designated as "Undifferentiated Rock Knobs" (Fig. 4), the proportion of soil to rock outcrop varies quite widely from place to place. Only where extensive submergence occurred, in this area, have the rocks been denuded by wave action, exposing bare knobs. For the most part, in Wilberforce, the till is unusually deep and few rock outcrops are apparent. This is particularly so in the northern sections of the township, while in the southernmost tip, the other extreme occurs and large outcrops are exposed. Where sufficient depth of soil permits profile formation, the product is a weakly developed podsol, the grey A_2 horizon seldom being deeper than two inches. The till is predominantly acidic due to its derivation from the underlying granite. Wherever soil formation is affected by underlying Precambrian crystalline limestone less acidity occurs.

Large numbers of soil types comprise the sand and clay plains of the northwest portion of the township (Fig. 4). Since elevations are lower, here, than elsewhere in the township the prime influence on soil formation is marine. The best examples of the clay soils formed under such conditions are seen in the Renfrew Clay and the Osgoode and St. Rosalie Clay loams (Fig. 6). The latter are dark surfaced clay loams with poor internal

drainage. In the virgin state, they possess a very shallow surface layer of mealy, clay loam ranging from a few inches to a foot in thickness. Level topography, freedom from stones and definite uniformity permit these soil types to be cultivated very easily. Limitations are vested in the natural susceptibility of the soils to drouthiness. The low humus content (2%) correlates with poor water holding capacity. In addition, these soils are low in available phosphorous which can only be supplied by parent clays which contain large amounts of phosphatic minerals.

The sandy areas, which fringe the clay lands to the south and west (Fig. 4), are best exemplified by the Uplands Sand and the more stony Monteagle Sand Loam (Fig. 6). The Uplands Sand, which is also found in large tracts along the north shore of Lake Doré, is an excessively drained acid sand which is seldom bouldery but often contains scattered amounts of gravel and cobbles close to the surface. In these areas near Lake Doré much alluviation has occurred to alter the soil structure. Periodic flooding by the lake has been responsible and the stretches of sand, closest to the lake, are quite thickly covered with fine silt.

Owing to the coarse, open nature of the soil materials drainage is excessive, except in areas where the water table comes close to the surface. The open nature and originally low lime content of the parent material and the coniferous type of vegetation which overlies it, combine to develop the podsol type of soil profile. The Monteagle Sand Loam may be described as being basically similar to the Uplands Sand but greater abundance of stones and cobbles as well as topographic diversity stand out as distinguishing features. This soil type and the Anstruther Sand are transitional between the soils overlying the Precambrian granite knobs and the

clay and sand loams just described.

The Eganville Sand Loam occupies a considerable area within the township. Vast acreages of land stretching south and southwest from Lake Doré past Mink Lake are covered with this soil type. Its parent material is derived from a calcareous till associated with the limestone bedrock which underlies most of the area.

The topography is strongly undulating, internal and external drainage being generally good. On slopes, areas of imperfect drainage may occur where a compact layer restricts both drainage and root penetration. The parent material consists of calcareous, unassorted till which is largely composed of angular and slightly rounded stones and boulders. Wherever present in sufficient numbers, cultivation is often restricted. In places, such as between Lake Doré and Mud Lake, marine and glacial melt waters have reworked the till materials, removing finer particles and leaving faint bars and beaches. Such localities have lighter soil textures, though often bouldery, and have profile development similar to the White Lake gravelly sand loam (Fig 6).

The surface soil in a cultivated field of Eganville Loam consists of a brown or dark brown loam five to seven inches thick. The natural fertility level is medium and the content of organic matter and nitrogen is medium to low. Soil reaction shows a neutral to mildly alkaline (pH. 7.0 to 7.9) and, according to chemical tests, the levels of available phosphorous and potash are low, while available calcium and magnesium are sufficient for most agricultural requirements.

Poorly drained muck is widely distributed throughout the township. The topography is commonly level or slightly depressional causing drainage,

in most places, to range from very poor to ponded (Fig. 6). The land, therefore, is vulnerable to periodic flooding. The surface of muck soils consists of sedge type vegetation underlain by a layer of woody material. The third organic layer is a sticky well decomposed black muck.

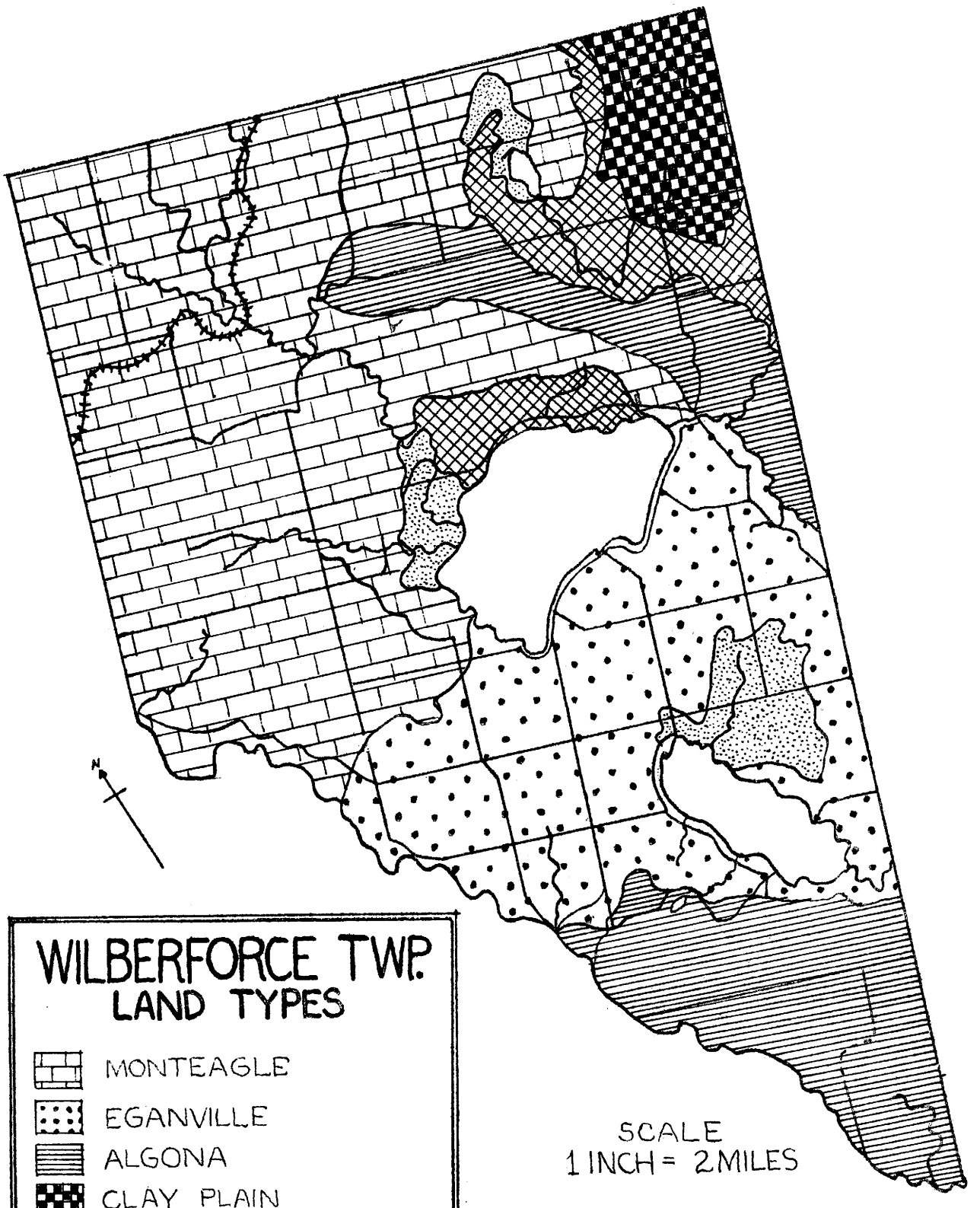
Land Types

The grouping of areas which have similar soils, topography and drainage conditions provides the geographer with a single physical unit known as a "Land Type". From the physical phenomena described, thus far, Wilberforce Township can be divided into six land types. A description of each will now follow.

1. Monteagle Land Type: This type is the most extensive and occupies a large area in the west and northwest portion of the township (Fig. 7). The physiography of this land type is variable; the lands north of and above the escarpment ranging from between 600' and 700' elevation, the lands south and below it being from 500' to 600'. The variability of the terrain is the result of deposition of rough unsorted mounds of glacial debris upon a floor of outcropping granite. The landscape is, therefore, undulating with large knobs of bedrock protruding above its uneven surface (Illus. 9). Wherever soil formation is possible the type resembles a weakly developed podsol, its relative degree of acidity or alkalinity being largely dependant upon the underlying bedrock. It is only in certain areas that the bedrock restricts drainage, the problem on most of the shallow soils being one of moisture retention rather than drainage.

2. Algona Land Type: This land type is to be found northeast of Lake Dore and in the southern extremity of the township (Fig. 7). Topographically it is flatter and less undulating than the Monteagle type and elevations

FIGURE 7


N
WILBERFORCE TWP.
LAND TYPES
MONTEAGLE
EGANVILLE
ALGONA
CLAY PLAIN
SAND PLAIN
POORLY DRAINED
SCALE
1 INCH = 2 MILES
DMH

Illus. 9: Typical landscape in the Monteagle Land Type. Agricultural activity is closely correlated with depth of overburden.

Illus. 10: Landscape typical of the Algona Land Type. Note the shacks which stand as a reminder of the farm abandonment of these lands.

range from 550' to 600'. The frequency with which outcroppings of bedrock occur within the confines of this land type also mark it as distinct from the Monteagle (Illus. 10). Any covering of drift occurs in very scattered patches and usually its shallow depth is prohibitive to land use other than forestry. Much of the poor scrub on the very stony, shallow soil will never reach merchantable size but provides, in a limited way, food and shelter for wild life. Drainage, as in the case of the Monteagle Land Type, is generally good to excessive, moisture retention posing as the main problem. Since organic matter is not found on the large areas of bedrock outcroppings which are denuded of vegetation the retention of moisture is impossible. Thus summer drouths frequently cause desicated soils which, from a physical standpoint, are useless to any cultivation.

3. Eganville Land Type: This land type is the second largest in the township and stretches south of Lake Doré to a point south of Mink Lake (Fig. 7). Since much of the area is underlain by limestone the soil is, mainly, a calcareous loam derived from a parent material composed of fragments of the underlying bedrock. The depth of drift over the bedrock is variable, but is generally more uniform than in the two previously described land types. Three definite classes based on the numbers and types of stones found in the overburden may be made. First there are the angular stones which are derived from till fragments, secondly there are the more rounded cobbles or gravel and, thirdly, at frequent intervals, may be found stones which have become directly separated from the underlying bedrock. Topographically, the landscape is smooth although numerous undulations are the result of irregularities in the underlying bedrock (Illus.12), and in the scattered ridges of drift so common in the area. Elevations

Illus. 11: Typical landscape in the Eganville Land Type. This particular section shows deep, fertile soils which support most types of agriculture successfully.

Illus. 12: A view of a poorer physically endowed section in the Eganville Land Type. This land, which is used as permanent pasture, is adjacent to that depicted above.

in this land type do vary greatly and range from 575' to 650'. Drainage is variable and wherever the water table is held up by rock strata, imperfect to poor drainage occurs. The weight of the water table is, of course, subject to fluctuation according to rainfall. In most cases, therefore, drainage is either excessive or imperfect, the latter being a seasonal condition.

4. Clay Plain: This land type, which occupies a small area in the northeast corner of the township, is recognized by its fairly level topography, absence of stones and its fine textured soils. Topographically, gentle slopes are encountered toward the small stream courses which dissect the plain, but generally, the land is flat, with little variation in relief (Illus. 15). Elevations range from 500' to 550'. The external drainage is moderate while the internal drainage is usually slow to very slow depending upon the imperviousness of the compact B horizon so common in soils of this land type. Most of the land in this class is cleared for agriculture but lands which contain a compact subsoil are left in pasture due to their restricted internal drainage. In common with the other land types thus far described, the Clay Plain suffers from excess moisture in wet seasons and periodic drouth in hot, dry weather.

5. Sand Plain: This land type is found in two well defined areas in the township. There is, first of all, the large transitional area in the northeast between the Clay Plains and the Monteagle and Algona Land Types. Next there is a large area north of Lake Doré which is also classified as belonging to this land type (Fig. 7). Topographically, this land type possesses the most diversified pattern of relief. For the most part, the smooth upland areas are bounded by steep slopes and elevations extend

Illus. 13: Landscape typical of the Sand Plain Land Type.

Illus. 14: A farm on the Sand Plain Land Type. Note the fine till material of fluvioglacial origin on this ploughed field.

from 575' to 650'. The sandy plains, which may be seen along the north shore of Lake Doré, consist of much fine alluvium which is deposited by the lake at times of flood. Consequently thick layers of this material may be found over the sand in tracts close to the lakeshore while, closer to the upland areas in proximity to the Cochrane fault line scarp, the amount of alluvium is almost negligible (Illus. 13). The topography in this sector slopes upward from the shoreline to the escarpment. Due to the coarse, open soil materials drainage is excessive except where the water table nears the surface. Bluffs formed along the edge of old stream channels are frequently subjected to wind erosion in the drier seasons.

6. Poorly Drained Swamps and Marshes: Several areas throughout the township may be included in this category (Fig. 7), the main criterion being poor drainage year round. The topography is commonly level to slightly depressional and thus encourages periodic flooding. Most of these poorly drained lands have been left under forest cover rather than cultivated since attempts at agriculture have, almost always, proved to be unsuccessful.

Illus. 15: The relatively flat, poorly drained landscape which typifies the Clay Plain Land Type.

Illus. 16: Poorly drained land along the fringes of a stream. Note the characteristic vegetation types associated with poor drainage conditions.

Illus. 17: A farmstead on the Clay Plain Land Type. Contrast this farm, with its well kept buildings, with the poor subsistance farm below.

Illus. 18: A subsistence farm of the Monteagle Land Type. Note the shabby, wooden buildings on the rock strewn pasture land.

Illus. 19: A well kept subsistence farm of the Monteagle Land Type. Note the small garden plot on the right of the photograph.

Illus. 20: A typical stump fence which is so common in the rough pasture lands of many subsistence farms in Wilberforce.

CHAPTER II

HISTORICAL DEVELOPMENT OF AGRICULTURE IN WILBERFORCE TOWNSHIP

History of Settlement

Wilberforce Township was first surveyed in 1851 (Kirkwood and Murphy, 1878, p. 146), many years after sporadic settlement had occurred within its newly defined boundaries. Lumbering operations in the preceding decades had been concentrated in the Ottawa Valley. With the growing demand for square timber derived from the best grades of white pine, the Renfrew hinterland became the next area to undergo large scale exploitation. Naturally enough the new lumbering industry provided a ready market for agricultural produce and much of the farming activity which existed around 1851 was devoted to supplying this need. By 1855 the existing patterns of settlement were closely associated with the various colonization roads constructed by the government. These roads were built to provide lines of communication into the new undeveloped lands of the Renfrew district which had been explored and pronounced fit for agricultural settlement. From these main arteries, shorter roads branched out to provide access to the more remote parts of the area.

The most important colonization road as far as Wilberforce Township is concerned was the famous Opeongo Road (Kirkwood and Murphy, 1878, p.145). It began at the village of Renfrew and following an old Indian trail, ran northwesterly, through Eganville, for about 80 miles. At Eganville subsidiary roads such as the Eganville-Cobden road and the Eganville-Pembroke road radiated outward through the township. These road networks, which

greatly facilitated the subsequent development of the township were the basis of the present day highways. Roads most certainly had a positive effect in establishing the earliest settlement patterns of the township, but modification of the earliest patterns was to come, later, because of economic and more markedly, environmental factors. These factors were to show that the original road plan was not as ideal as first hoped.

The first positive government programme of land settlement came in 1868. In that year, the newly formed provincial legislature passed the famous Free Grants and Homestead Act (Kirkwood and Murphy, 1878, p. 268). The conditions of settlement under the act were an inducement to the large numbers of European immigrants who came to this country in the latter part of the 19th century. Many settlers, mostly of Irish and German origin, came to Wilberforce. Along both the colonization roads and the subsidiary township survey roads, lots from ten to twenty chains in width were staked out to provide the settlers with their promised free grants. As the settlers arrived in ever increasing numbers large areas of land became cleared, farmland acreage expanded and tiny hamlets began to spring up at important crossroads. Between 1861 and 1881 the population and the area of occupied agricultural land more than doubled (Census of Canada, 1861 - 1881).

With the decline of the lumbering industry after 1890, greater emphasis on agriculture revealed, for the first time, the limited potentialities of the land. Now that the best merchantable stands of timber had been almost completely exhausted, depopulation and farm abandonment of the lands with poor, stony, shallow soils began. Where other areas of land promised a growing environment conducive to agriculture, great numbers of displaced

settlers became concentrated. Behind them they left their crudely built, deserted log shacks to stand as grim reminders of man's conquest by both economic and natural factors.

Although the patterns of agricultural settlement in Wilberforce Township have changed very little since the beginning of this century, it is important to note that differentiation of agricultural activity has been largely controlled by the physical environment. The colonization roads did serve their intended purpose of introducing and stimulating settlement of the region. The original settlement patterns associated with these roads have been modified and readjusted to conform to the most productive land. Therefore, to-day's settlement patterns may be more closely correlated with land types. In the chapter dealing with contemporary agricultural land use this topic will be discussed in some detail.

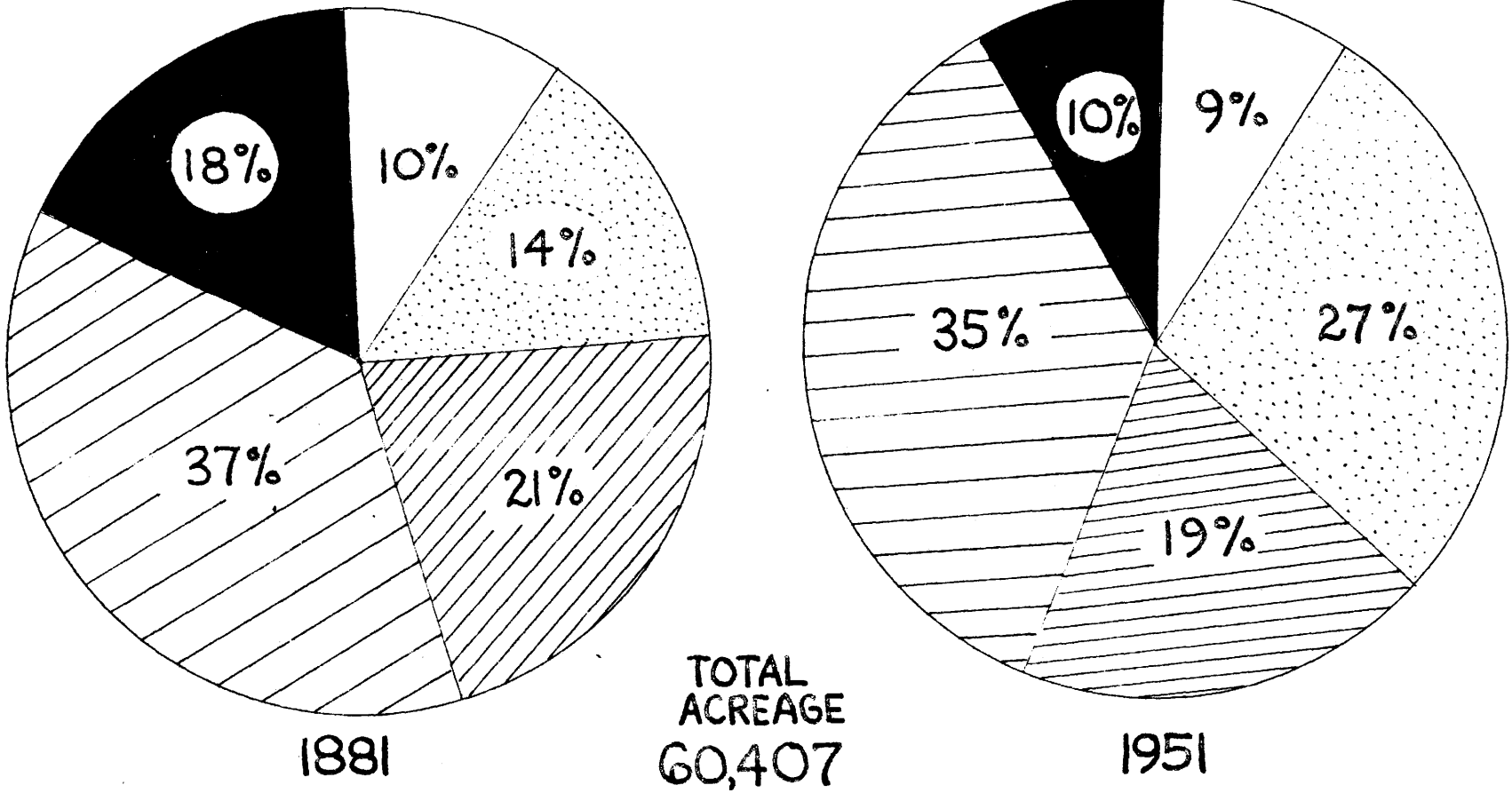
Evolution of Agricultural Land Use

The development of agricultural land use in Wilberforce Township had its beginnings in the years prior to the great logging boom of the mid 19th century. In this period the few existing farms were mere clearings for the growth of subsistence crops. Lumbering whichwas as sporadic as the crude agricultural clearings, occupied most of the farmers' time and efforts. After 1850, with the increased lumbering activity, settlement was stimulated, roads were constructed and agricultural land use underwent a substantial change. The lumber farms of the heavily timbered regions were still maintained but the development of farms for the purpose of supplying the needs of this industry was a notable addition to the existing form of land use. Larger acreages were cleared and more land became intensively cultivated.

The Free Grants and Homestead Act of 1868 imposed certain land use restrictions on the settlers. The act specified clearance of at least 15 acres of land upon initial occupancy, to be followed by annual clearings of two acres for a period of five years. All minerals and pine trees on the free lands were to be property of the crown and reserved for exploitation under license only. Initial free grants were to consist of 160 acres which could be supplemented at the cost of 50 cents per additional acre (Kirkwood and Murphy, 1878, pp. 268-272).

By 1881 commercial agriculture in Wilberforce had reached its height which was coincident with the peak of the lumbering industry. Agricultural production and development had been stimulated along certain lines, notably hay, wheat and potato cultivation. In 1881 as many as 1389 acres were used for wheat growing whereas at present less than 300 acres are being used for the same purpose (Census of Canada). The most notable difference in land use practices of 1881 and the present day can be seen in the relative paucity of acreage devoted to pasture (Fig. 8). Before 1890 livestock raising constituted a very small portion of the agricultural economy. Sheep rearing for wool was the major animal raising activity during these years. The sheep, to-day, has lost its favoured position to the ubiquitous herds of dairy and beef cattle and plays a minor role in the present agricultural economy.

After 1890, the decline of the lumbering industry transformed not only the distributions of population but also the existing forms of land use. Changed emphasis in agricultural production as well as a slow increase in farm size were very important in this connection. Since farm settlement had advanced with lumbering operations, the long term population loss associated with the decline of the industry was responsible for the gradual



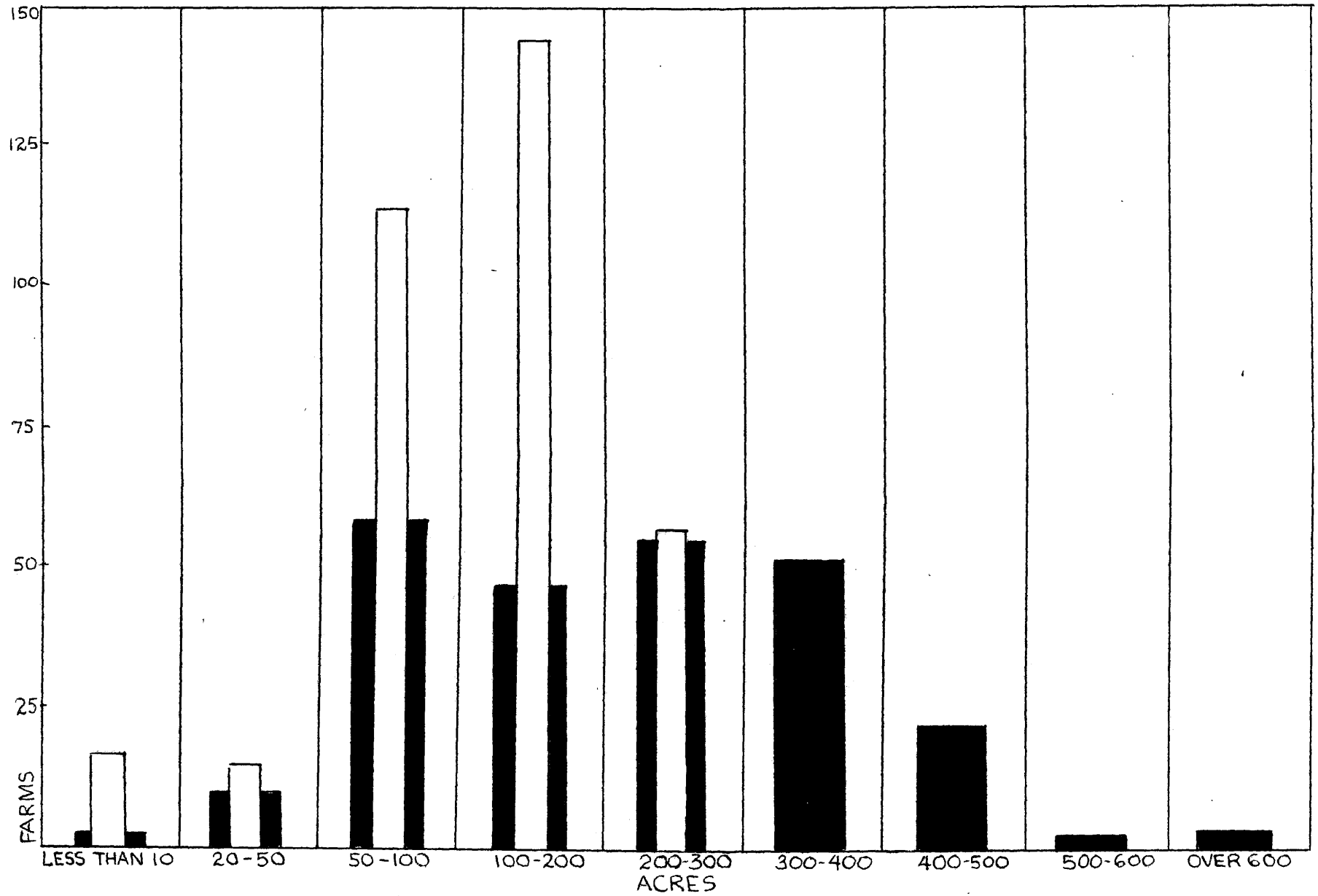
COMPARISON OF AGRICULTURAL LAND USE 1881 & 1951

WILBERFORCE TOWNSHIP

FIGURE 8

change in land use. Farm sizes increased and more extensive rather than intensive land use practices occurred. The fullest effects of this change were not appreciated until after 1910 but comparison of farm sizes in 1881 and 1951 provides a good illustration (Fig. 9). The larger farms included greater acreages of pasture land for the rearing of cattle and the majority of cropland acreage was cultivated for forage crops. The intensity of farm specialization and activity can, like settlement, be directly correlated with the physical base best suited to agricultural land use.

Since the first decades of this century land use patterns in Wilberforce have undergone little change. Each year sees additional farm abandonment of the poorest lands, but despite this factor land use in Wilberforce is stabilized by both the physical and economically submarginal position of the township.



1951
TOTAL 240

COMPARISON OF FARM SIZES 1881 AND 1951
WILBERFORCE TOWNSHIP

1881
TOTAL 346

FIGURE 9

CHAPTER III

THE AGRICULTURAL GEOGRAPHY OF WILBERFORCE TOWNSHIP

Present Agricultural Land Use

Broadly speaking, Wilberforce Township may be considered as being a livestock and mixed farming region located on the fringe of Precambrian Ontario. It is therefore within a transitional zone which separates the more fully developed agricultural regions of southern Ontario from the barren, rocky wilderness of the Precambrian Shield to the north. A close examination of the present land use pattern reveals a differentiation of human activity based upon influences which are characteristic of both regions.

In the preceding chapter it was noted that agricultural land use became confined to certain areas where the physical base was optimum. Settlement and agriculture were seen to gradually adjust themselves along the paths of least environmental resistance. To more fully appreciate the present agricultural pattern, some attention should be given to the association of the natural environment with existing land use practices. The land type classification which was described in chapter one showed that there were six basic land types in the township (Fig. 7). Each land type contained a certain physical unity of slope, drainage and soil conditions. By a discussion of land usage[1] within each land type it may be

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[1]Information presented in this section is based upon interviews with farmers. These interviews which were conducted during field work preparation, totalled 15 and were selected on a basis which would be representative of the various land types.

seen, whether or not, agricultural practices have been adapted to the physical qualities of the respective land types.

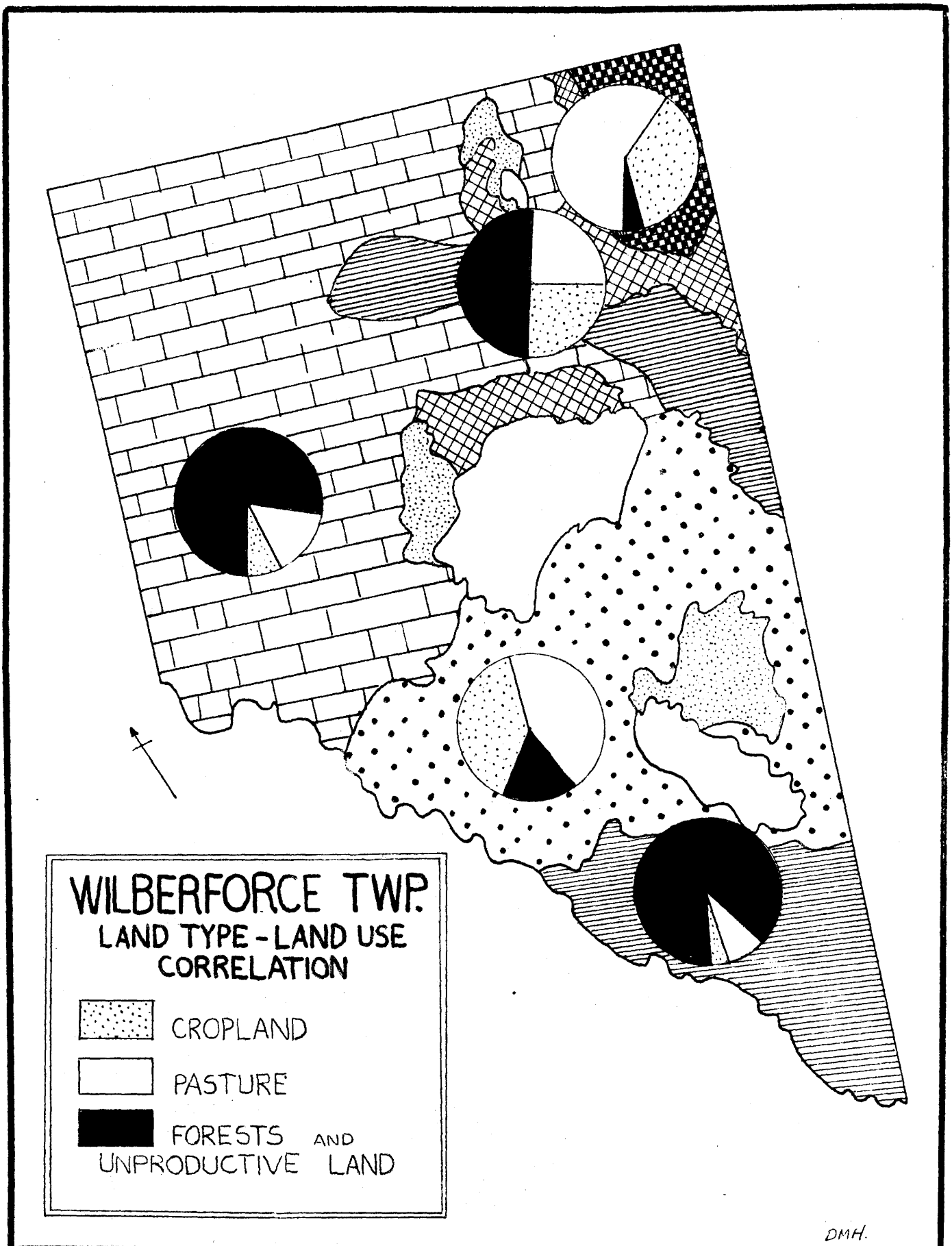
1. Monteagle Land Type: The large boulder strewn clearings (Illus. 18) on this land type are the result of forest fires or human attempts to provide pasture for livestock. Pasture land is, therefore, mostly unimproved and cropland is almost non existant. The poor stony, shallow, soils support a crude growth of scrub vegetation on their poorest tracts. Poorly drained sections with deeper soils provide a growing environment for coniferous vegetation. Deciduous stands are associated with those areas of less acid soil conditions and the poorly drained lands of freely circulating water.

The typical farmstead on this land type usually consists of 200 to 400 acres of which, in most cases, 50% will be unfit for use. Approximately 75% of the farm is left under forest cover, thus leaving 25% for tillage and grazing purposes (Fig. 10). Only about five to ten head of dairy cattle are kept since the poor cropland will only provide feed for that many cattle during winter. The remainder of the cleared land is pasture of the poorest type. Farms such as this are not mechanized and the entire acreage is usually assessed for about $600. Income is derived from sales of milk and cream to the nearest dairy and is supplemented by cash returns from the selling of firewood.

The very low productivity of the land has been greatly aggravated by severe summer drouths. This has caused many farmers to abandon the land and move to the economically secure confines of nearby municipalities.

2. Algona Land Type: This land type has the poorest environment for agriculture in the township (Illus. 10 and 18). No farms are to be

FIGURE 10


WILBERFORCE TWP.
LAND TYPE - LAND USE
CORRELATION
CROPLAND
PASTURE
FORESTS AND
UNPRODUCTIVE LAND
DMH.

found in the northern sections of this land type while those in the southern sections are located in isolated positions. In this southern area the most marked degree of farm abandonment can be seen with numerous rude, log shacks standing on the rocky, boulder strewn pasture land (Illus. 10). For the most part, much of the land in this class is owned by farmers located in better physically endowed sites who use the rough scrub vegetation cover as a source of firewood.

3. Eganville Land Type: On the good tillable loam soils of this land type a greater intensity of land use is apparent (Illus. 11). Land use, of course is dependant upon topographic considerations and the depth and stoniness of soils. Where the soil can be advantageously cultivated farms average about $2800 to $3000. Of the total acreage 70% is utilized (Fig. 10); one half being for crop growth and the other half being used as pasture land. The remaining 30% of land is too poor to permit profitable use and is usually left under forest cover. The main agricultural practice on farms of this land type is dairying and, to a lesser degree, mixed farming. Forage and root crops, potatoes, and some corn are grown to supply the farmer's own requirements. Subsidiary income is derived from occasional sales of cattle and swine as well as firewood.

4. Clay Plain: Like the farms associated with the Eganville Land Type, the land use of farms in this class is intensive. On the Clay Plain the highest amount of cleared land is found (Fig. 10) and due to the deep soils and generally flat terrain (Illus. 15 and 17) the highest degree of agricultural activity occurs in the township.

Farm sizes average between 95 and 100 acres, consisting of 60% pasture, 35% cropland and 5% uncleared of natural vegetation. The emphasis

upon dairy herds is greater on this land type than elsewhere in Wilberforce and fluid milk and cream are produced in large quantity. Cropland is mainly devoted to forage crops such as oats and barley with rotations of timothy, hay and alfalfa being practiced on a "once in four years" basis. The average farm on this land type is usually assessed for about $6000. and is fully mechanized. Although the highest proportion of income is derived from dairying, sales of eggs, hogs, and yearling calves provide supplementary income. In addition, some farmers own woodlots in the poorer sections of the township and gain much income from sales of wood for fuel and building purposes.

5. Sand Plain: This land type displays a form of land use which is in sharp contrast to that of the Clay Plain. Largely due to differences in soil type and relief land use in this category is both more extensive and diversified than the intensive specialized forms of the Clay Plain.

The average farm size, on this land type is about 250 acres, of which one half is usually still under forest cover (Fig. 10). On a typical Sand Plain farm 100 acres might be devoted to pasture and 100 to cropland with the remaining acreage being used as a woodlot. Along the north shore of Lake Doré, areas which are included in this land type display land use which is much similar to that already described. However rich alluvial deposits have formed over the sand in tracts close to the lake. The total acreage for farms in this location is similar to others of the land type but richer, more workable soils and flatter terrain have permitted more intensive land use. Thus less land is still under forest cover and more is available for crops and pasture. The practice of using no fertilizer but cropping a field for two years and then using it as pasture is

successfully carried on. By ploughing the grass under, prior to cropping, nutrient value is restored to the soil.

Hay, oats and barley are the main forage crops grown on farms of this land type while the raising of beef and dairy cattle, in equal proportion, is the chief animal rearing activity. Due to the diversity of land use practices on this land type, farm income is derived from many sources with no particular activity predominating. Farm values are more variable here, than elsewhere in the township because of the relative intensity of land use practices and domination of one form over another.

6. Poorly Drained Swamps and Marshes: This land type imposes the strictest land use practices if profitable utilization of the soil is to be made. Organic soils are generally low in plant nutrients and require careful and extensive fertilization. Thus the great cost of developing and maintaining production on these soils has acted as a major deterrent to their use. Most of the poorly drained land in the township, therefore, has remained under its characteristic forest cover rather than undergo exploitation to produce crops which must be specialized to yield high returns.

In the foregoing discussions land use has been shown to have a definite relationship to the favourable and unfavourable features of each land type. In the Monteagle and Algona Land Types, shallow soil development and rough bouldery soils have acted as the chief impediments to profitable land use. Dessication of the sandy soils due to moisture deficiency in the warm dry seasons has also been shown to provide an unsuitable growing environment. On these land types, the most direct result has been large scale farm abandonment.

On the Eganville and Clay Plain Land Types wider application of fertilizers might be used to produce higher crop yields. Lime, commercial fertilizers, alfalfa and other legume crops do restore valuable nitrogen which produces particularly good results when applied to grain crops. Although the cost of maintaining fertility is higher on the loam soils of the Eganville type, quite often more tractable physical qualities act as a counterbalance.

Detailed information as to whether the land is being used to its greatest productive advantage can only be appreciated from the generalizations presented in the preceding correlation of land use within a particular environment. Actually the only indication of successful crop adaptability to a specific growing environment is examination of average yields. Yield data on such a comprehensive scale are not available for Wilberforce Township. Nevertheless it may be said that certain areas within the township might be better used if left under forest cover rather than be subjected to agricultural use. Repeated attempts to grow crops have always met with failure and return of these lands to forest cover would be both economically and conservationally ideal.

The Agricultural Economy of Wilberforce Township

Although there is little relationship between farm size and farm value in Wilberforce, there is a definite correlation between farm values and the physical environment since the largest farm acreages are associated with the poorest land. Human activity, to a lesser degree, has influenced farm values. The original road pattern which preceded realization of the land's fullest potentialities has largely been preserved by the advent of the automobile. Roads stimulated agriculture in certain areas by providing

access to markets. The dairy industry grew with the development of the motor trucks which hauled its produce. Where transportation facilities and good productive farmland originally coincided the highest farm values may be found. Although the undesirable lands, for the most part, are presently isolated from good roads (Illus. 22), this isolation may be attributed to the slight readjustment of road patterns to suit the more productive land types. Thus the human aspects of land use have been generally dominated by the physical scene.

Despite the differing physical settings in the township which have offered less resistance to optimum land use practices in certain places total agricultural production is mainly of economically submarginal status. Towns such as Pembroke, Renfrew, Eganville and Arnprior (Fig. 1) have supplied a ready market for farm products in the past. However competition from other regions of higher agricultural productivity such as the extensive lowland areas to the southeast has seriously threatened the future of agricultural prosperity in Wilberforce Township.

In recent years population decreases have been a very direct result of the dwindling farm economy. Agriculture has tended to abandon its commercial functions and revert to a subsistence type as nearby, better physically endowed farmlands have entered into competition for markets. The production of milk has not, as yet, suffered with the loss of markets for other agricultural products. Due to the extreme perishability of dairy produce, there is little likelihood that this activity will suffer. Demands for fresh milk and cream will always exist in the urban centres nearby and location close to these markets is, perhaps, the industry's greatest asset.

CHAPTER IV

NON AGRICULTURAL LAND USE OF WILBERFORCE TOWNSHIP

The acreage of land in Wilberforce Township devoted to non agricultural uses is small. Nevertheless the numerous functions of non agricultural land use deserve special consideration since their distribution over the area is related to both physical and human factors.

Lumbering: The main historical features of the lumbering industry have been discussed in chapter two. Mainly due to the removal of the best stands of white pine, large scale commercial lumbering activity is no longer important in Wilberforce. Existing activity, although small and limited to certain districts, is worthy of note. As previously mentioned much of the presently forested area, which is uncleared for agricultural use due to physical limitations, is owned by farmers who cut wood for fuel and building purposes. Some of the timber has been sold to other farmers providing supplementary income to the owners of these woodlots. For the most part, this is the only existing forest exploitation in the township. There is, however, still some full-time commercial lumbering activity which is both small in its operations and its confined location. In the Partridge Lake - John's Lake District (Fig. 2) logs are cut for cord w ood and hauled by truck to Eganville or by rail to Pembroke where they are processed (Illus. 24) into lumber and building supplies.

Minerals: With respect to minerals, the township is not wealthy (Satterly, 1944). Mineral extraction has been limited to limestone quarrying in areas whose economic importance has declined in the last 20 years.

Three abandoned quarries may be seen in the township to-day. Two are located on Paleozoic limestone at Concession VII, Lot 16 and near Eganville. The third is on Precambrian crystalline limestone and is located at Concession XVIII, Lot 20. In the case of the latter quarry, operations ceased in 1940. Before this date, coarse grained crystalline limestone was quarried for the purpose of making lime. Processing of the stone into lime was done in a plant, on the location, which consisted of a single draw stone kiln. Because the coarse grained limestone tended to crumble during the burning process, the stone was hand picked. The lime, which was used mostly for building purposes, was a light brown colour. At present there are no limestone quarrying operations in Wilberforce. With the declining demand for pure lime and building stone many of the quarries in the area have been forced to stop production. Pure lime's importance in the manufacture of calcium carbide has also given way to the development of synthetic processes.

Deposits of marl, which have not as yet been exploited for industrial uses, extend over a large portion of the bottom of Mink Lake. Exposures along the south shore line reveal deposits which are, in places, over nine feet thick. At present Wilberforce Township does not contain minerals which are of any economic significance. Mineral exploitation, although profitable in the past, is, to-day, a forgotten industry because of the declining need for the few minerals which are available in the township.

Recreation: Wilberforce Township is ideally suited to the needs of the tourist trade. With its two major lakes and its streams and rivers, the location provides an environment which is appealing to both campers and tourists.

Cottages are located on the northeast and eastern shores of Lake Doré as well as in many locations around Mink Lake. On the northeastern shore of Lake Doré, cottages have been constructed on the well drained, hilly slopes. On the eastern shoreline, cottages are located in a very thin strip between the highway and the shoreline. These cottage plots which are restricted to an area not much wider than 100 feet, are gradually being reduced in width by wave action along the shoreline of the lake. Thus cottages along the eastern shore of Lake Doré will have to move as property is threatened each year.

For the most part, recreational land in the Lake Doré area is located where it does not conflict with agricultural land use. The land devoted to recreation is, as a result, of poor quality and has never proved suitable for agriculture. For this reason alone it is hard to conceive of its ever being ideal for recreation.

Conditions around Mink Lake are entirely different from those at Lake Doré. In this area, recreational land use does not enter into as pronounced a conflict with agricultural use since the land adjacent to the lake is generally unsuitable for farming. Poor drainage and thin soils are the main barriers to agricultural land use and thus recreational development has gone ahead unchallenged. The greatest concentration of recreational activity is at Mink Lake, as a result, and apart from a relatively poor physical environment, future expansion of the tourist trade in this area is a certainty.

It is easy to see that the distribution pattern of recreational land is controlled by two dominant factors. The first, which is self explanatory, is location near bodies of water. The second, though not quite so

obvious, is the association of recreational land with agricultural land. Where competition has arisen between the two land uses the agricultural has always won, causing recreation to be confined to the remaining unsuitable areas. As we have seen, this is most apparent in the Lake Doré area.

Many of the smaller township lakes, which are little more than ponds, could be developed for recreational purposes since their clear waters abound in all types of game fish. Such lakes as Green Lake, Johns Lake and Partridge Lake (Fig. 2), although relatively inaccessible, could be advantageously developed for the tourist trade.

Urban Land Use: Most of the tiny crossroad hamlets which occur throughout the township are at least a century old and bear the names of some of the earliest settlers in the district (Illus. 21). A typical Wilberforce hamlet consists of a general store, post office and one or two houses. The gas station, to-day, replaces the shed of the local blacksmith whose location in the many hamlets was of great importance to the surrounding communities. Such places as Rankin, Bulger, Griersford and Germanicus (Fig. 2) have served as supply points for both tourist and farmer in the past. Apart from this function they have not been engaged in any other significant activity. Expansion of these small municipalities with their very limited function is doubtful. Their trade is local and limited to satisfying the most immediate needs of their respective districts.

The Village of Eganville: (Fig. 11). The village of Eganville (population 1326) is bissected by the Bonnechere River and lies partly in Wilberforce and partly in Grattan Township (Fig. 2). Being the largest urban agglomeration in Wilberforce, it is a commercial focus for the township and a market for agricultural produce.

Illus. 21: The little hamlet of Knightington in the south tip of Wilberforce Township. Little municipalities such as this have very limited functions and will probably never expand to any appreciable size.

Illus. 22: A township road. This photograph, taken in the Mink Lake district, depicts the poor roads which prevail in the more isolated areas of the township.

The location of Eganville is the result of human factors acting upon a resisting physical base. Although offering such barriers to human activity as an inefficient water and sewage system the location of the site was ideal as a logging station in the early days of settlement. Most of the resisting elements of Eganville's site have been overcome, in recent years, by human foresight and ingenuity.

The north bank of the Bonnechere, at Eganville, consists of a steep slope which rises approximately 70 feet from the river. At the top of this 70 foot height a narrow bench occurs and then the rise continues for another 20 feet. The terrace-like structure on the north bank of the river is formed by the mergence of the Eganville fault-line scarp with the Douglas fault-line scarp (Fig. 4). The rock is stratified Trenton and Black River limestone of Ordovician age which is subjected to differential erosion. The southern bank of the river, unlike the north, is unmarked by structural displacements and rises in a relatively uniform fashion from the river (Illus. 26).

The earliest function of Eganville was that of a lumber camp site on the Bonnechere River. During the height of the great logging boom it was forest wealth which paid for the launching of the first businesses in Eganville. Not only were commercial retail outlets established but a sawmill and grist mill provided services to the surrounding community (Eganville and District Old Home Week, 1948). These latter enterprises saw, early, the full potentialities of exploiting the swiftly flowing waters of the Bonnechere for power. Not only was the Bonnechere River an early source of water power to the numerous mills along its shores (Illus. 25) but annually, from the first thaw in spring until late summer, it was the

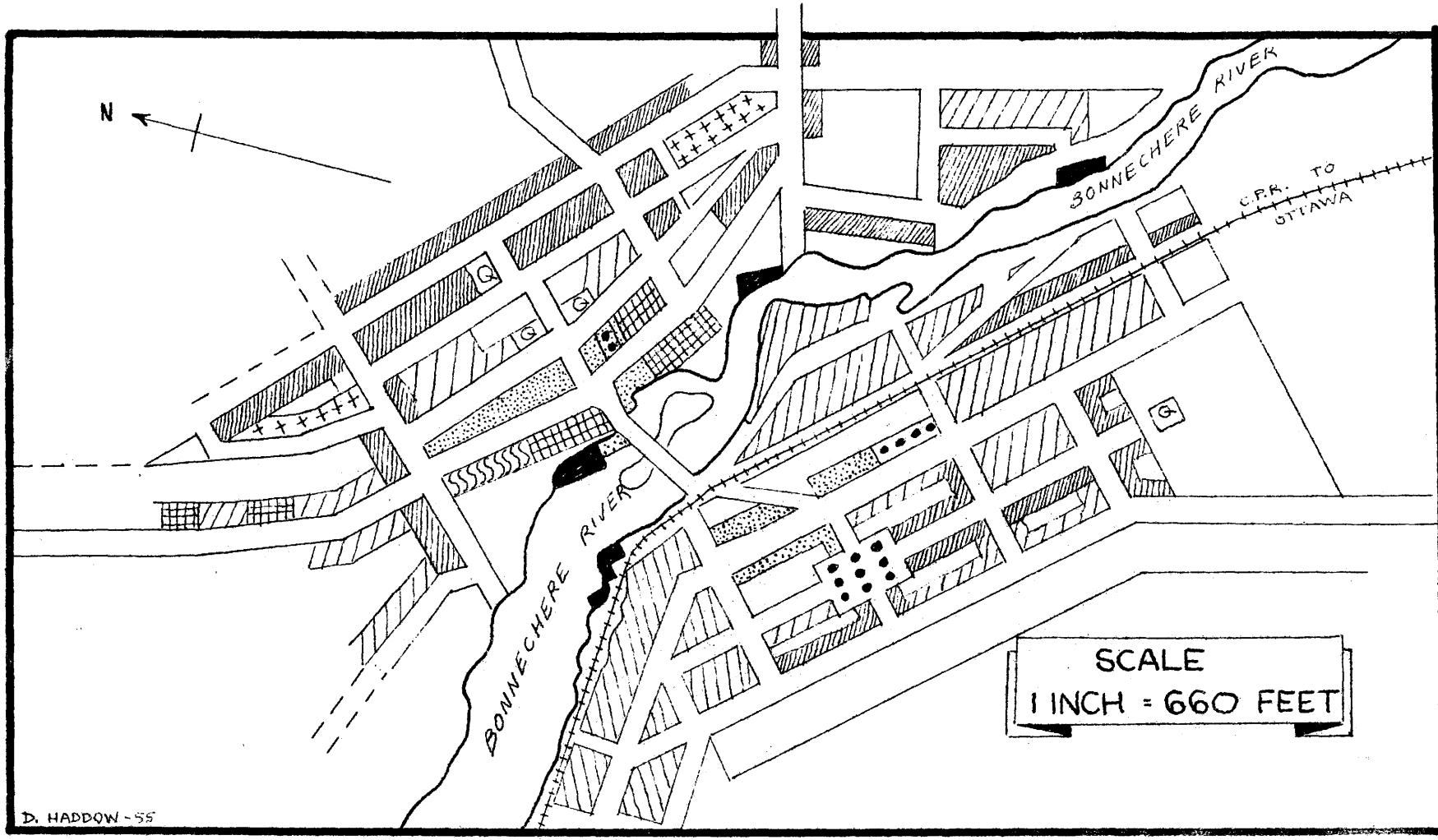


FIGURE 11

EGANVILLE

A FUNCTIONAL MAP

RESIDENTIAL I II III

COMMERCIAL SERVICE RETAIL WHOLESALE

INDUSTRIAL

PUBLIC PUBLIC QUASI-PUBLIC Q

RAILWAY

scene of the great logging drives. With the decline of the logging industry, toward the last few decades of the 19th century, the forests no longer provided the immediate stimulus to life in the village. Thus farming began to emerge and develop into an integral part of business activity. Commenting on the decline of lumbering around Eganville at the turn of the century the editor of the "Eganville Star Enterprise" remarked, "the forests are gone, long prosper the plough" (Eganville and District Old Home Week, 1948).

The fact that the famous Opeongo colonization road passed through Eganville was an important factor in the early development of the village. Expansion continued still further as numerous extension roads began to radiate from Eganville to all parts of the surrounding countryside. Eganville became the retail and industrial centre for Wilberforce Township after 1860. Milling and light manufacturing such as coopering, waggon making and blacksmithing as well as the retail trade of manufactured goods, were the chief occupations of the village people. Although many of the village functions associated with lumbering have vanished Eganville has changed very little since its incorporation as a village in 1891. Gone are the horses, and the associated wagon maker and blacksmith, to be replaced by the automobile and the ubiquitous gas station.

The population of the village has remained relatively stable since 1901. After the decline of lumbering in the district many people came to Eganville to reside permanently. This particular aspect can be seen in the increase of population between 1891 and 1901 from 315 to 1107 (Census of Canada).

Present day Eganville, whose population is slightly over 1300 people,

is a thriving village which caters to the needs of both farmer and tourist. Amongst its commercial functions are small stores which sell hardware, farm implements, groceries and clothing. Services are rendered by various mills, auto repair and machine shops. Industry in Eganville is both small and light and is presently confined to building materials, bakeries and dairy processing. A planing mill which is located on the south bank of the Bonnechere (Illus. 24) obtains wood from nearby woodlots and processes the raw material into plywood and other suitable building needs. Recently this plant has undertaken manufacture of unfinished furniture products for wholesale trade with large retail firms in Ottawa, Montreal and Toronto. This factory, which employs 60 people, is the largest enterprise in Eganville. The other major businesses are a bakery, which employs 45 people, and a large creamery which offers jobs to 25 people.

The general urban plan is closely controlled by the physical restrictions of the site. The streets run parallel to the steep slope on the north bank of the river and to the gentler rise of the south bank. Higher property values may be closely correlated with the best drainage conditions which prevail on the slopes. This factor accounts for the predominance of first class residential property on the steeply sloping north bank of the river. Houses of very low value are found on the poorly drained terrace of the north bank and in the flatter poorly drained land of the south bank.

Perhaps the greatest disadvantage of the site may be seen in the village water supply. The Bonnechere is used for sewage disposal purposes and water for home consumption must be obtained from wells. Due to the extreme depth of the water table on the north bank of the river, wells cannot be

Illus. 23: A small township sawmill where farmers may obtain service and assistance in the cutting of wood to fuel size.

Illus. 24: A planing mill in Eganville where builder's supplies and small wooden articles are processed. Unfinished furniture for the wholesale trade is also assembled here.

Illus. 25: An old water-powered mill located on the Grattan Township side of the Bonnechere River. The use of water has been replaced by electricity, as a power source, for most mills in the area.

dug and water is continually trucked from wells on the south bank to a large storage reservoir. Water supply has always been a major problem to the residents of Eganville. At present about one half of the population have running water while the other half is without.

The Bonnechere River is a limited source of hydro electric power for Eganville. The Eganville Light and Power Company has a generator which, at full capacity production, fills only one half of the village hydro requirements. As a result the Rural Hydro Electric Power Commission furnishes the remaining needed electricity from power stations on the Ottawa River. The latter source has proved to be more satisfactory to Eganville residents because of its lower cost and relative freedom from periodic breakdowns.

Eganville's population includes a very high proportion of retired people (40%). Many of these are retired farmers who do odd jobs of carpentry and other handiwork to supplement their old age pensions. Of the gainfully employed (60%) at least 10% commute to jobs at Chalk River, Pembroke, and the nearby R.C.A.F. radar station at Foymouth.

Modern Eganville is dominated by both physical and human factors. The physical, which have already been discussed, give rise to certain spatial limitations, while human implications which are mainly economic, have tended to prevent Eganville from expanding to town status. This latter point can best be appreciated in the light of Eganville's position in an economically submarginal locality. Overshadowed by larger municipalities such as Arnprior, Pembroke and Renfrew, Eganville will probably remain at her present size.

Illus. 26: A view of the southern bank of the Bonnechere River at Eganville. Many of the houses on this side are in poorly drained locations due to the gentle slope of the terrain away from the river. This is in direct contrast to the steepness of the north bank.

Illus. 27: The village of Eganville on the Bonnechere River. This photograph shows the main business section.

CHAPTER V

SUMMARY AND SYNTHESIS

Wilberforce Township, at present, provides man with a home which is restricted by certain physical and economic limitations. The idea that the physical environment has entirely dominated human efforts to seek a livelihood needs to be modified by other considerations. Man has, to a large degree, molded the landscape to suit his needs and, in doing so, has often indescriminately exploited the natural resources. While it is true that the best roads and the most concentrated areas of settlement are closely correlated with the most productive land it may be said that greater foresight by man in the use of resources might have supported a larger and more uniformly distributed population than that which actually exists.

When logging activity reached its height in the latter part of the 19th century little consideration was given to what might happen to the land when the best timber stands were gone. Had some attention been paid to conservation of the valuable trees or proper forest management practices much of the population which has now abandoned these areas might still be effectively employed in forest industries. As it is to-day, many burnt and cut-over clearings reveal very poor, bouldery pasture land with rough, shabby-looking log buildings. Many of these dwellings are abandoned and others soon will be as shallow, coarse, infertile soils, and periodic drouths make subsistence more and more difficult.

With the removal of forests covering the deep, stone-free clays and the better drained sand and clay loams, farming supplanted lumbering as the main form of human activity in the township and settlement became associated with the best agricultural land. The fact that the original uniform distribution of roads has been modified by man's relation to the land is revealed by this association. The once heavily travelled roads into the more productive lumbering areas are, to-day, mere dirt tracks when compared to the smooth, hard-surfaced highways which serve the more agriculturally productive districts.

Although good, tillable land in Wilberforce is generally limited to these tracts of good soils man's successes in making a living have also been thwarted by economic obstacles. Here, competition from more productive areas to the south and southeast part of the province has caused a loss of many markets for agricultural produce which, after the decline of lumbering, were a mainstay in the economic life of the township.

Wilberforce Township thus presents a picture of an area which, because of its poor physical background and limited natural resources, will probably never support a large population. The fact is that ruthless exploitation of such natural wealth as does exist has rendered a large portion of the land unfit for human habitation. Reforestation of those lands which are unfit for agriculture must be effected if future development of the township is to be assured. In this way conservation of water for hydro-electrical projects might provide an incentive to manufacturing in the nearby towns. Further expansion of the tourist industry is a possible means of development in districts which will never be suitable for agriculture. In any case both physical and economic limitations show the

necessity of using land for other purposes than those which are incapable of affording an adequate subsistence for the population.

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WILBERFORCE TOWNSHIP

LAND · UTILIZATION

SCALE 2 INCHES = 1 MILE

LEGEND

FOREST		AGRICULTURAL		WASTE		URBAN	
Cf	CONIFEROUS	Co	CROPLAND	x	MARSHLANDS	V	URBAN
Df	DECIDUOUS	P_1	PASTURE (IMPROVED)	ω	ROCKY-WASTE		
Sc	SCRUB	P_2	PASTURE (UNIMPROVED)		TOWNSHIP BOUNDARY LINE		

PAVED ROAD — UNPAVED ROAD — RAILWAY

LAKE DORÉ

MINK LAKE

EGANVILLE

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