A GEOGRAPHICAL STUDY

OF

CULROSS TOWNSHIP

A THESIS

PRESENTED TO

THE FACULTY OF THE DEPARTMENT OF GEOGRAPHY

McMASTER UNIVERSITY

HAMILTON, ONTARIO

In Partial Fulfillment

of the Requirements for the Degree

Bachelor of Arts

by

George William Sled

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The author wishes to express his thanks to the staff of the McMaster University Geography Department for their advice and guidance in the preparation of this thesis, and especially to Dr. H. A. Wood for his valuable suggestions and for his constructive criticisms of the draft manuscript.

The author is also indebted to J. Moffat, assessor for Culross Township, who provided many of the agricultural statistics; and to many other people of Culross who were kind and helpful in their interviews.

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FOREWORD

The purpose of this thesis is to discuss and explain both the physical characteristics and the historical developments of Culross Township, in order to show their relationship to each other, and to the present land use.

After describing the Township's physical setting - bedrock geology, physiography, climate, natural vegetation, and soils - the author discusses the periods in the historical development, the present land use, and finally, the urban geography of Culross.

Field work for the thesis was done by car and on foot during the weeks of late August and early September, 1962. Air photos facilitated the work. Important sources of information were the Bruce County Soil Report, the Census of Canada, and personal interviews with people of both the rural areas and urban centres of Culross.

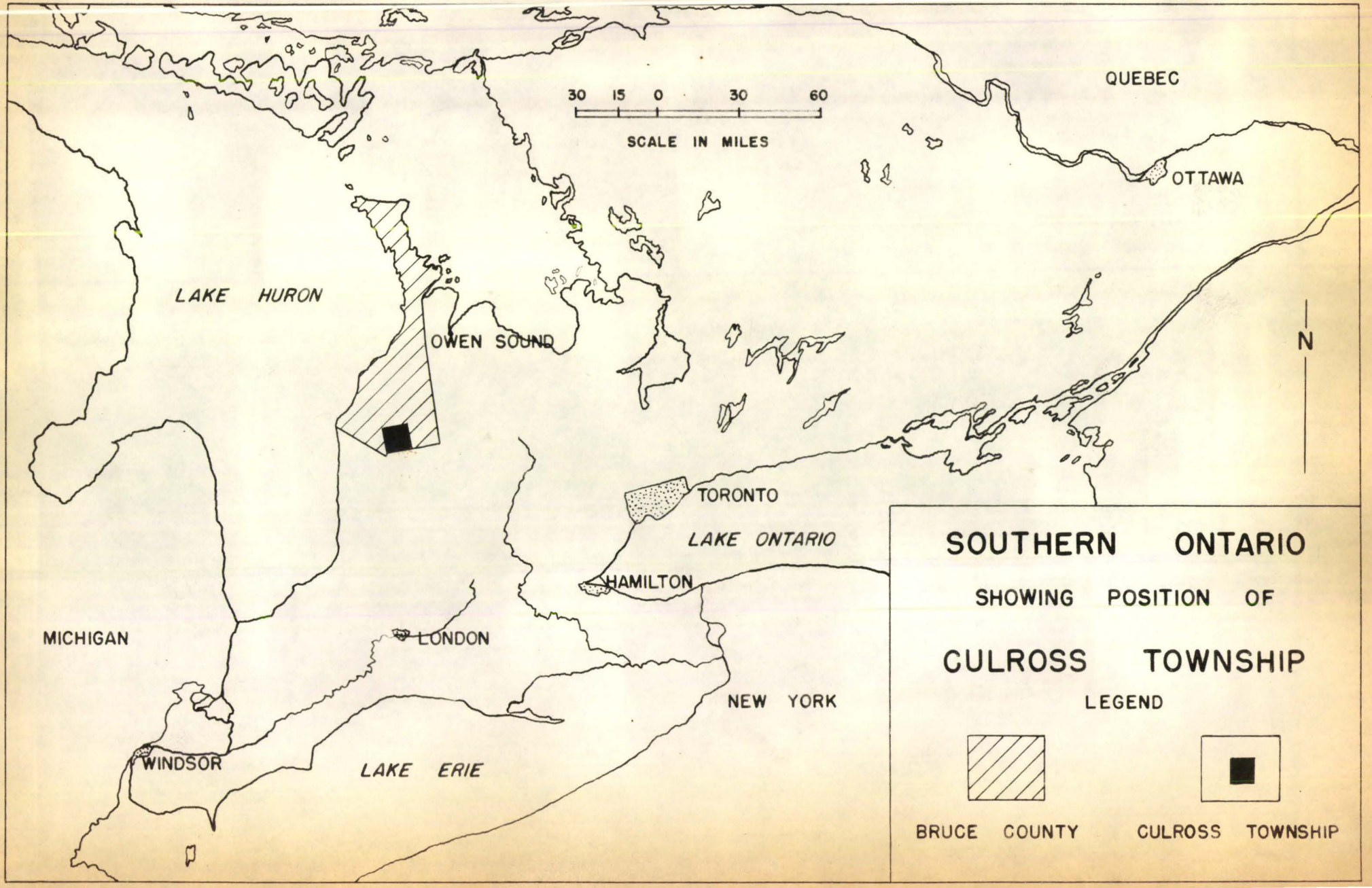
INTRODUCTION

Culross Township is located in the Southern margin of Bruce County (figure 1). The neighbouring townshipsare Greenock to the north, Carrick to the east, Huron to the west, and Turnberry (in Huron County) to the south (figure 2).

Almost exactly square in shape, or approximately ninety square miles, Culross Township comprises a total acreage of 57,835. The population in 1961 was 2,688, giving a density of about twenty-two people per square mile.

The area of greatest relief occurs in the south-west, where there are many rounded hills interspersed with valleys. In general, however, the highest portions of Culross are along the eastern margin, and the lowest are in the north-west (figure 3). The Teeswater River, with its tributaries (figure 4), follows the slope of the land from east to north-west, emptying into the Saugeen River a few miles north of Culross.

Culross is a rural township; its three urban centres are comparatively small villages (figure 4), and the predominant land use is agricultural.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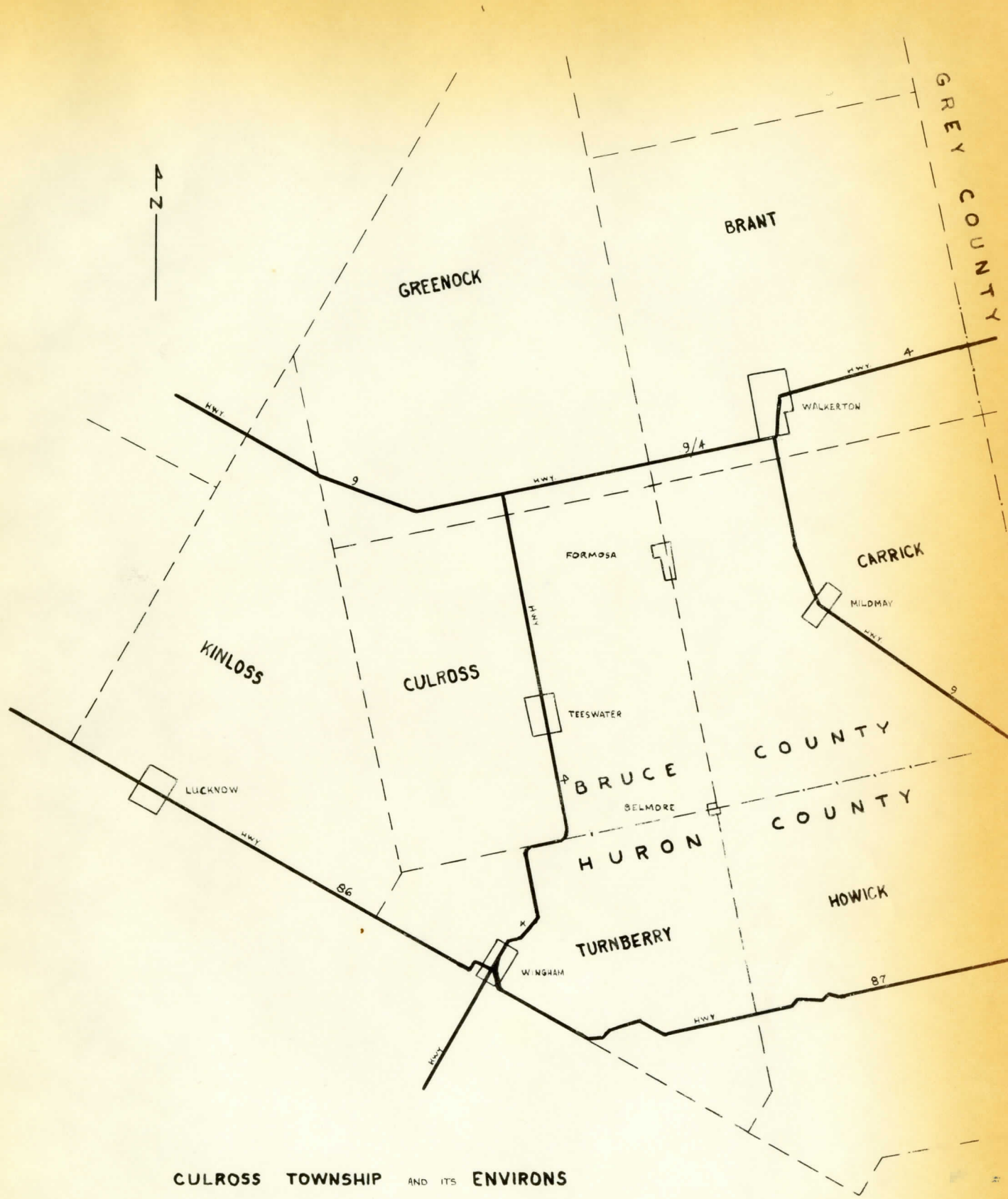
SCALE IN MILES
QUEBEC
OTTAWA
LAKE HURON
OWEN SOUND
N
TORONTO
LAKE ONTARIO
HAMILTON
MICHIGAN
LONDON
NEW YORK
WINDSOR
LAKE ERIE
SOUTHERN ONTARIO
SHOWING POSITION OF
CULROSS TOWNSHIP
LEGEND
BRUCE COUNTY
CULROSS TOWNSHIP

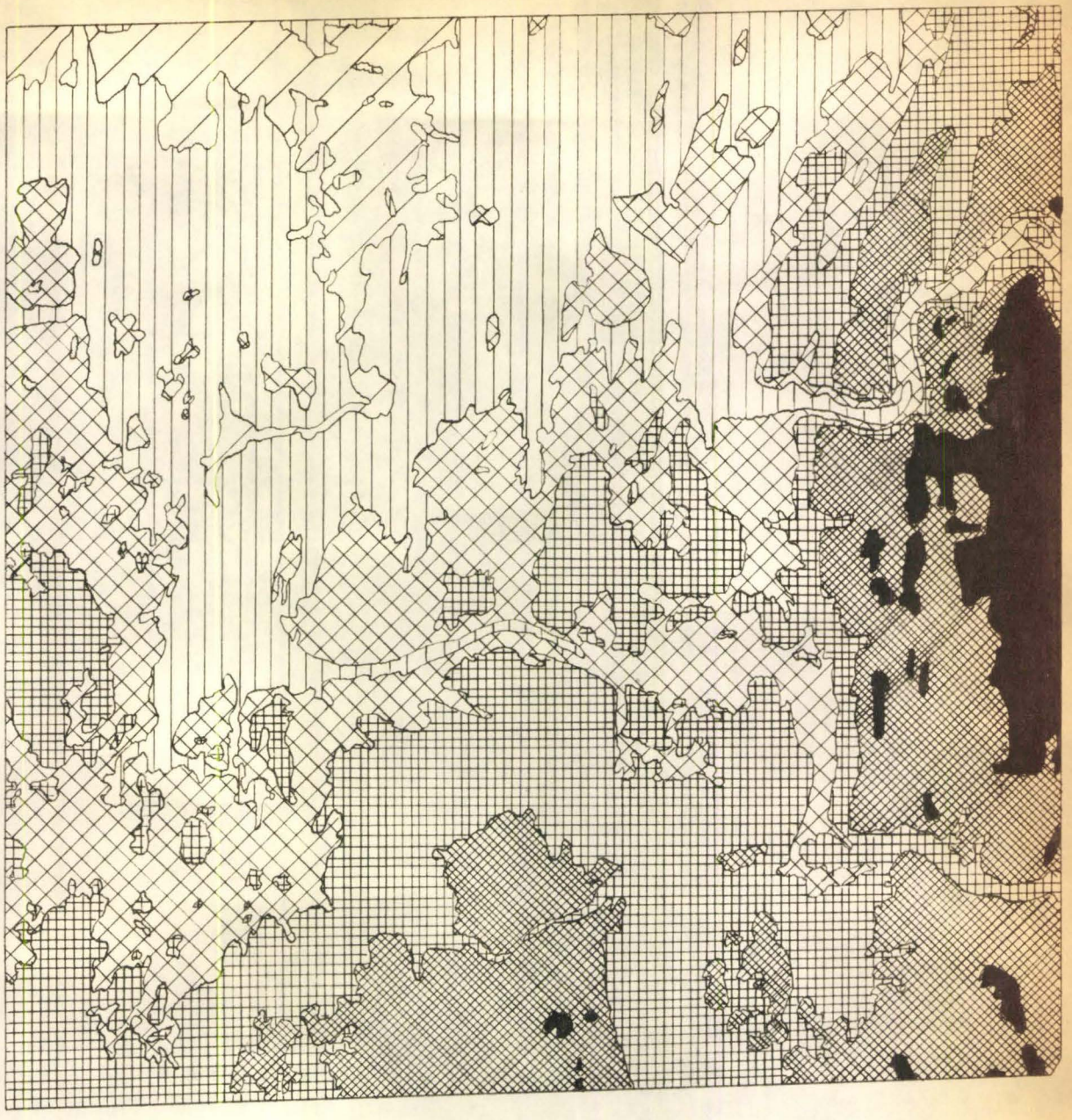


CULROSS TOWNSHIP AND ITS ENVIRONS

scale 1" 4 MILES

fig 2

CULROSS TOWNSHIP



N

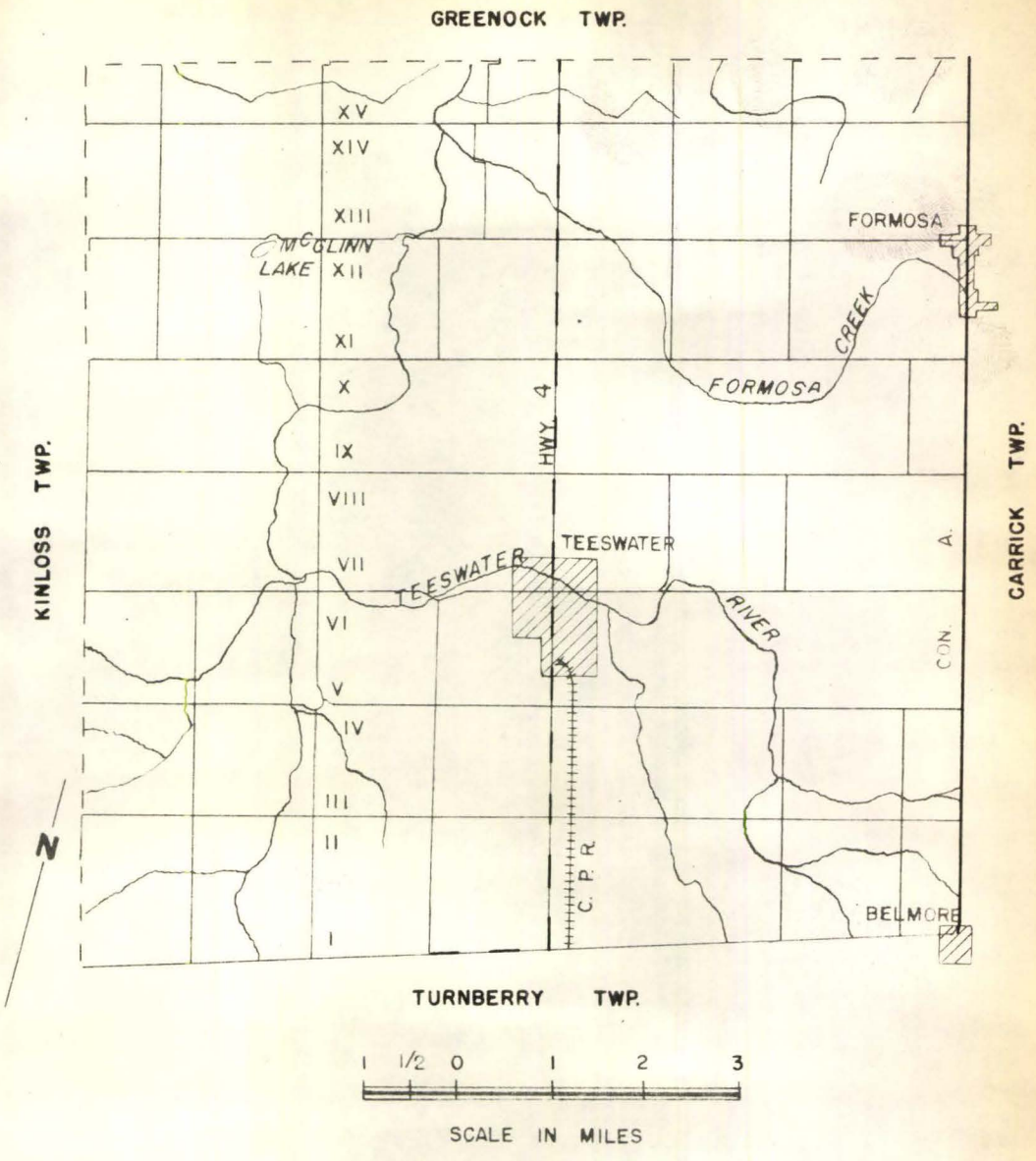
RELIEF MAP

legend

850' – 900'	
900' – 950'	
950' – 1000'	
1000' – 1050'	
1050' – 1100'	
1100' +	

SCALE 1" = 1½ MI.

CULROSS TOWNSHIP



BASE MAP OF CULROSS TOWNSHIP

LEGEND

- KING'S HIGHWAY (NO. 4)
- COUNTY ROAD
- OTHER ROAD
- RAILWAY
- TOWNSHIP BOUNDARY
- LAKES & RIVERS
- URBAN CENTRE
- IV CONCESSION NUMBER

CHAPTER I

PHYSICAL GEOGRAPHY

Bedrock Geology

The bedrock of Culross Township consists of sediments of Devonian, Silurian, and Ordovician age, resting upon an uneven surface of Precambrian igneous and metamorphic rocks. The sedementaries are little disturbed, their only deformation being a dip to the south-west towards the Michigan Basin (figure 5) at approximately twenty feet per mile.

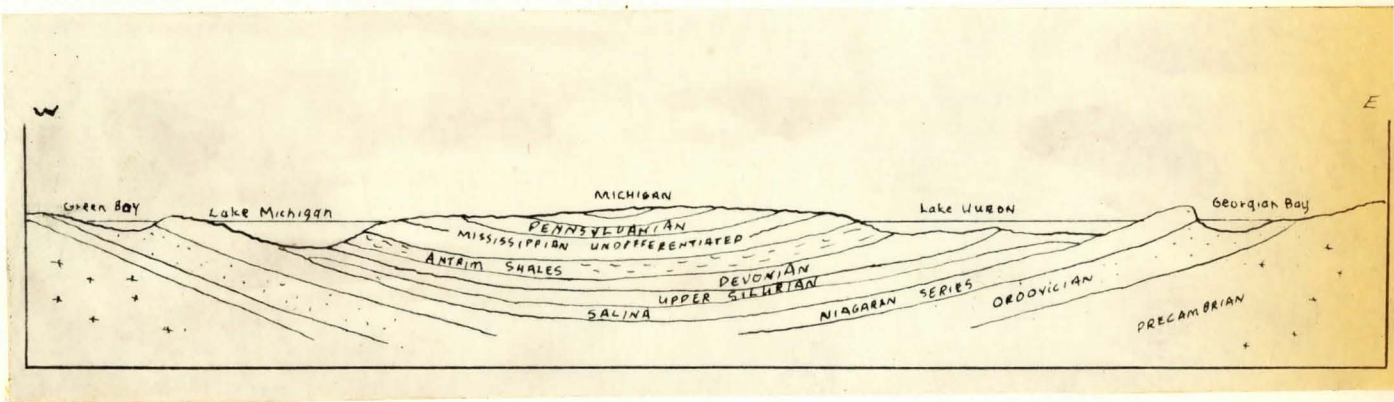


Figure 5. Geologic cross-section of the Michigan sedimentary rock basin, showing Lakes Michigan and Huron lying in zones occupied by relatively weak rocks of the Antrim shales and Salina Group, Green Bay and Georgian Bay lying in zones of weak Ordovician rocks and the escarpment of Niagara dolomite separating the lakes from the bays.[1]

Bedrock outcrops, all of the Devonian System, are exposed in relatively few places in Culross (figure 6). Usually these occur where glacial spillways have cut through the drift; for example, one outcrop about three miles east of the village of Teeswater on

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1. J. L. Hough, The Geology of the Great Lakes (Urbana: University of Illinois Press, 1958)

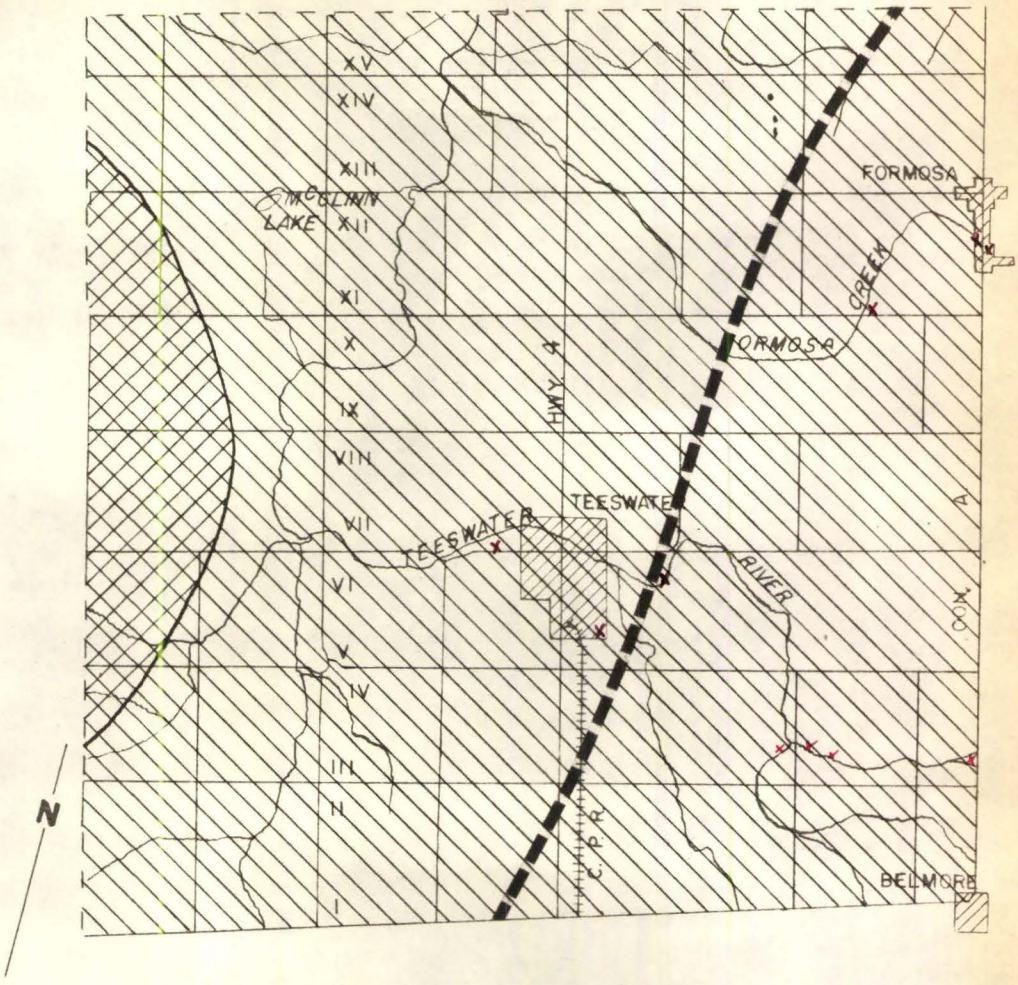
the Teeswater River (photo 1); a second about one mile east of Teeswater also on the Teeswater River; another at the village of Formosa along both sides of the Formosa Creek (photo 2); and again, just west of Formosa where Concession X crosses the Formosa Creek. In the village of Teeswater itself, the bedrock has been exposed by quarrying.

Two formations of the Devonian System, the Delaware and the Norfolk, underlie Culross Township (figure 6). Although predominantly limestone, they both have some beds of dolomite and some nodules of chert.

The Delaware Formation underlies a small crescent-shaped area in the west; no outcrops occur. From records of welldrilling, it has been discovered that there are distinct beds in the Delaware; the upper ones are buff to brown fine crystalline limestone with chert nodules; the lower ones are buff crinoidal arenaceous limestone, also containing some chert.

The Norfolk Formation, which underlies all but the crescent-shaped area, also occurs in distinct beds, the upper strata being finely granular buff dolomite, and the lower ones being bands of harder browner, high-calcium limestone. Although all the rock outcrops in Culross are of the Norfolk Formation (figure 6), yet in the south-east and north-east parts of the township, the outcrops differ markedly from those in the quarry in Teeswater. The quarry outcrops are brown dolomites and limestones in definite beds; the outcrops of the south-east and north-east are, on the other hand, grey to bluish and brownish, fine-grained crystalline limestone, commonly massive with no definite bedding

CULROSS TOWNSHIP



GEOLOGICAL MAP

LEGEND

NORFOLK FORMATION
(BROWN & BUFF LIMESTONE, CHERT)

DELAWARE FORMATION
(BROWN & BUFF LIMESTONE AND DOLOMITE, SANDSTONE)

REEF FORMATION
(REEF IS EAST OF LINE)

ROCK OUTCROPS

FIG. 6

visible (photo 1). Moreover, in these latter outcrops the presence of corals and a conspicuous reef-like character has led Caley to identify this as a reef formation within the Norfolk[1]. Since its exact boundaries are unknown, this reef formation has been generally located, but not accurately mapped (figure 6).

Bedrock has influenced the type of glacial drift in some areas of Culross, and in so doing has partially determined the characteristics of a few of the soil catenas. Moreover, the bedrock has had other effects on Culross; for example, prior to 1928 lime was produced from rock of the lower part of the Norfolk Formation, quarried near Teeswater, by the Gypsum, Lime and Alabastine, Canada, Limited. This project was abandoned, mainly because the company opened up quarries near Paris which were closer to their markets in the Toronto-Hamilton-Kitchener area. The presence of twenty feet of water covering the high-calcium limestone in this quarry prevents further extraction of the good quality lime. Attempts to drill for oil in Culross have never been successful and we can assume that no oil pools underlie the township. A well drilled for oil at Formosa in 1901, however, yielded fresh water which has been flowing ever since, but has never been utilized commercially. In Teeswater, two flowing wells have been of considerable value, the one giving the Teeswater Creamery a constant supply of fresh water; and the second, drilled in 1947, supplying water for the village water system.

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1. J. F. Caley, Palaeozoic Geology of the London Area, Ontario. (Ottawa, 1943). p. 47.

Preglacial Topography

Prior to glaciation, the rocks forming the rim of the Michigan Basin (figure 5) had been eroded by streams. Since the Norfolk Formation, particularly the associated reef formation, was massive and generally resistant limestone, no deep, wide valleys were cut into it. Instead, the large valleys were cut into weaker, less resistant rocks north-east of Culross. This is shown by a map of bedrock contours compiled by the Department of Mines[1]. Culross was an area of highland, uncut by deep valleys.

The Pleistocene Glaciation

In the last million years, at least four separate glacial ages have advanced and retreated across Southern Ontario (appendix I). These movements have greatly modified and obscrued the physical landscape of Culross that existed before glaciation occurred.

Of the four glacial advances, only the last, or Wisconsin advance, has left visible traces in Culross Township. Earlier glacial deposits have been covered by Wisconsin drift or eroded away. During the Wisconsin glaciation, ice advanced to cover Culross and the whole of Southern Ontario. As the ice moved, it eroded the pre-Wisconsin glacial deposits, and, where the ice over-rode this detritus, it built landforms such as the drumlins and till plain of Culross Township.

The glacier began to grow thinner, ceased to move, and in time melted sufficiently to expose an oblong area of land extending

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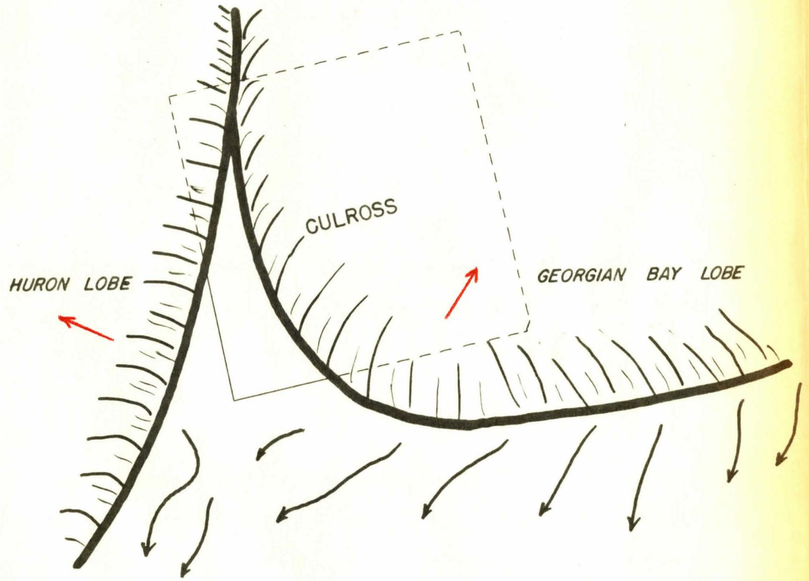
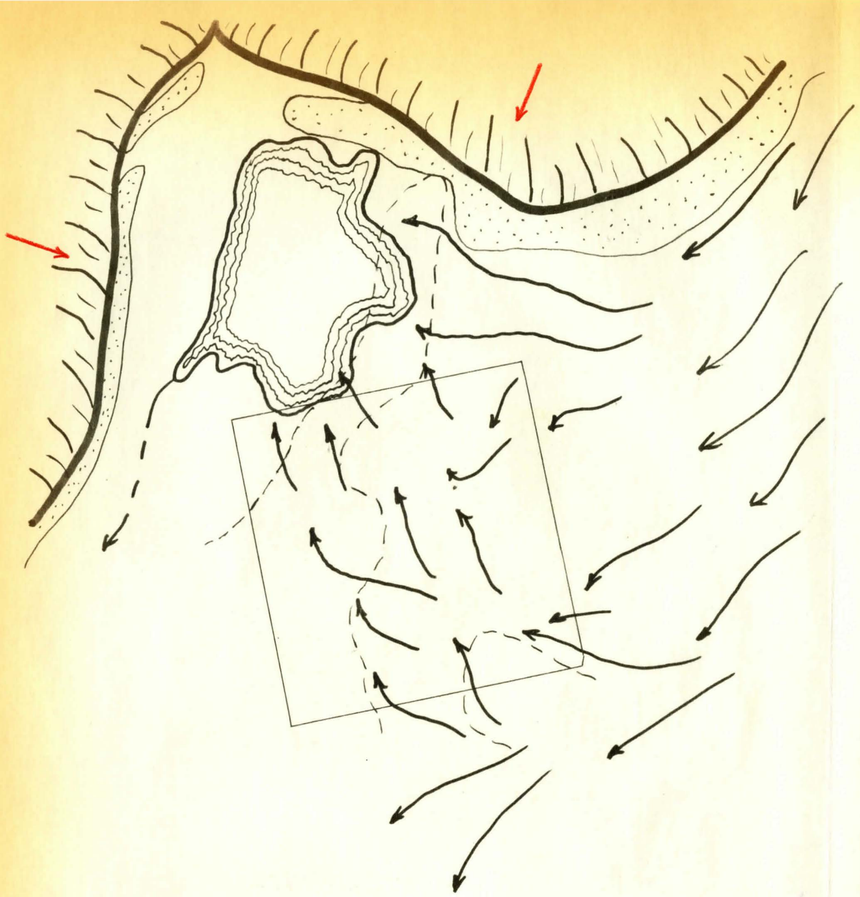
1. L.L.Davies, W.R. McClymont, Preliminary Map P165 (Kincardine-Walkerton Sheet.)

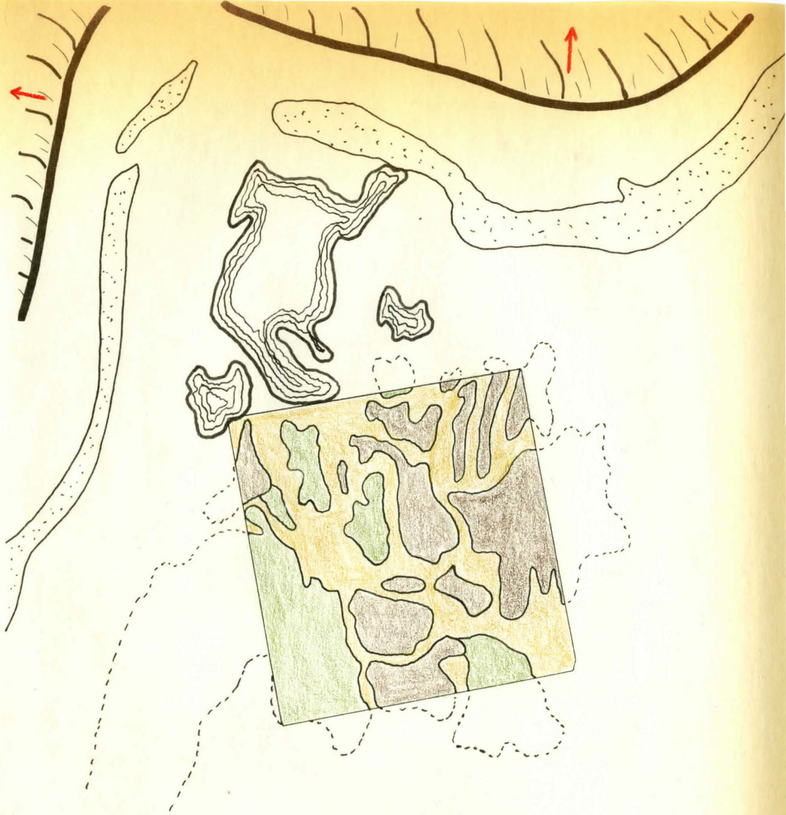
SKETCHES TO SHOW RECESSION OF ICE LOBES FROM, AND FORMATION OF PRESENT PHYSIOGRAPHY OF, CULROSS TOWNSHIP.



STAGE 1.



STAGE 2.



STAGE 3.

legend:

- ICE FRONT
- POSITION OF CULROSS TOWNSHIP
- DIRECTION OF FLOW OF GLACIAL MELTWATER
- PONDED MELTWATER
- OUTLET FOR PONDING
- PROBABLE EXTENT OF KAME-MORAINES
- DIRECTION OF ICE MOVEMENT
- TILL MORAINE
- PRESENT KAME-MORAINE
- PRESENT TILL PLAIN
- SPILLWAY CHANNELS

Scale. 1" = 4 mi

N

SCALE: 1" = 4 mi.

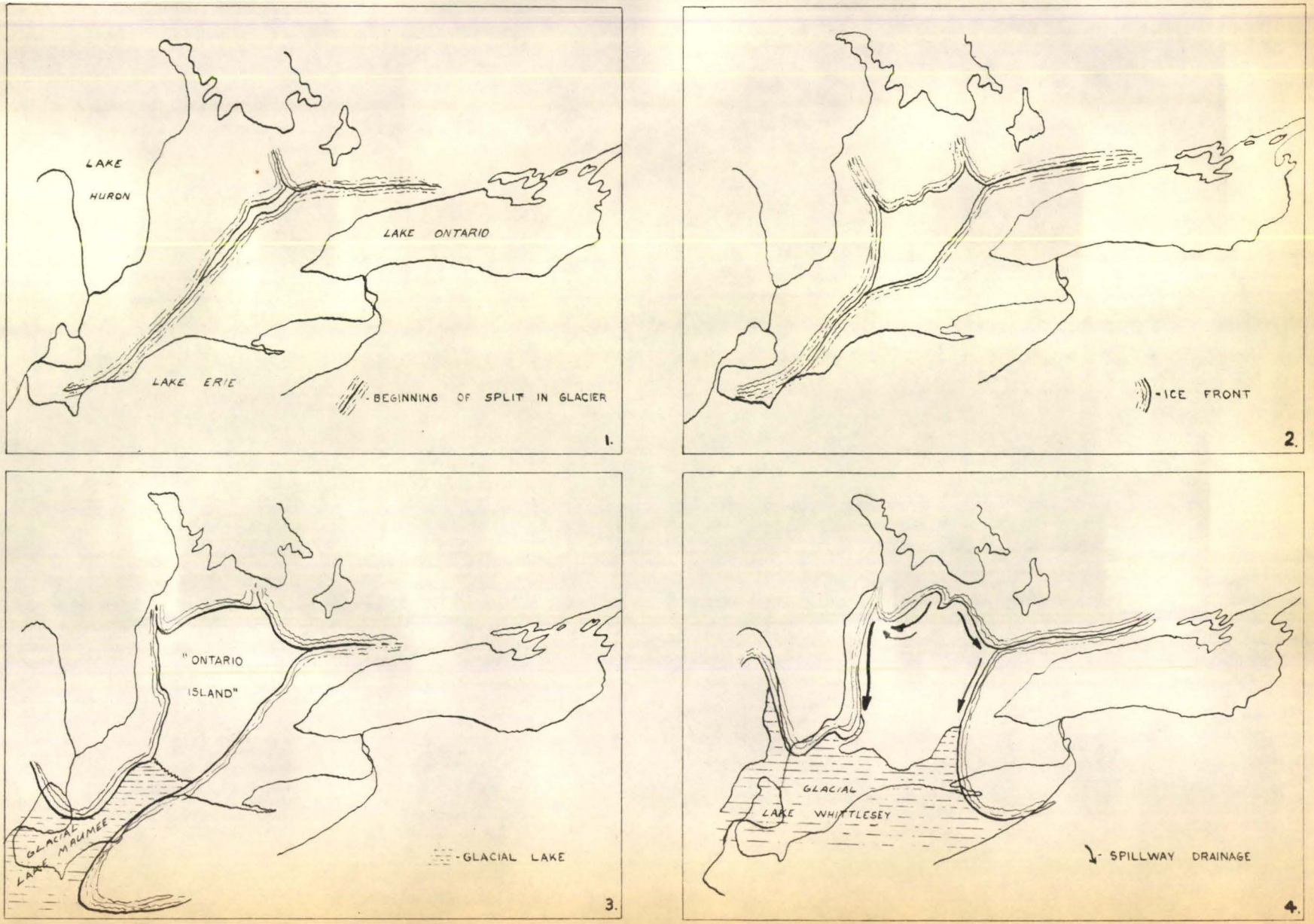


FIG. 7

STAGES IN THE WISCONSIN RECESSION

(after CHAPMAN & PUTNAM 1951)

SCALE 1" = APPROX. 80 MILES

from the present site of London to that of Dundalk, a village south-east of Collingwood[1]. This area is known as the "Ontario Island" (figure 7). The two lobes thus formed grew thinner until further divides occurred over the highest land, and four lobes were formed (figure 7, stage 2). Since Culross was an area of Highland, the western lobe divided approximately over Culross to form the Huron lobe and the Georgian Bay lobe. The movements of both of these lobes, and the meltwaters from them, were responsible for many of the present landforms of Culross Township (map 1).

When the split occurred over Culross, the ice fronts of the lobes were at approximately the boundary of Culross with Kinloss and Turnberry Townships (figure 8, stage 1). The Georgian Bay lobe left scattered groups of kame moraine along its inactive front, the most westerly of which can be seen in Culross just to the west of Belmore (map 1). Kame moraine and ridges of boulder clay were deposited in the western part of Culross Township at the line of contact of the Huron and Georgian Bay lobes. Hence, this Wawanosh kame moraine (figure 9) is considered by some authorities to be interlobate in origin[2].

Having built these moraines, the two lobes retreated some distance to the north and west. The recessions of the lobes uncovered the drumlins and till plain that the Wisconsin glacier had formed previously during its advance across Ontario. Then a readvance of both lobes

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1. L.J.Chapman, D.F.Putnam, "The Drumlins of Southern Ontario" Trans. of the Royal Society of Canada, 37, Section 4, 1943

2. L.J.Chapman, D.F.Putnam, "Recession of the Wisconsin Glacier" Trans. of the Royal Society of Canada, 43, Section 4, 1949

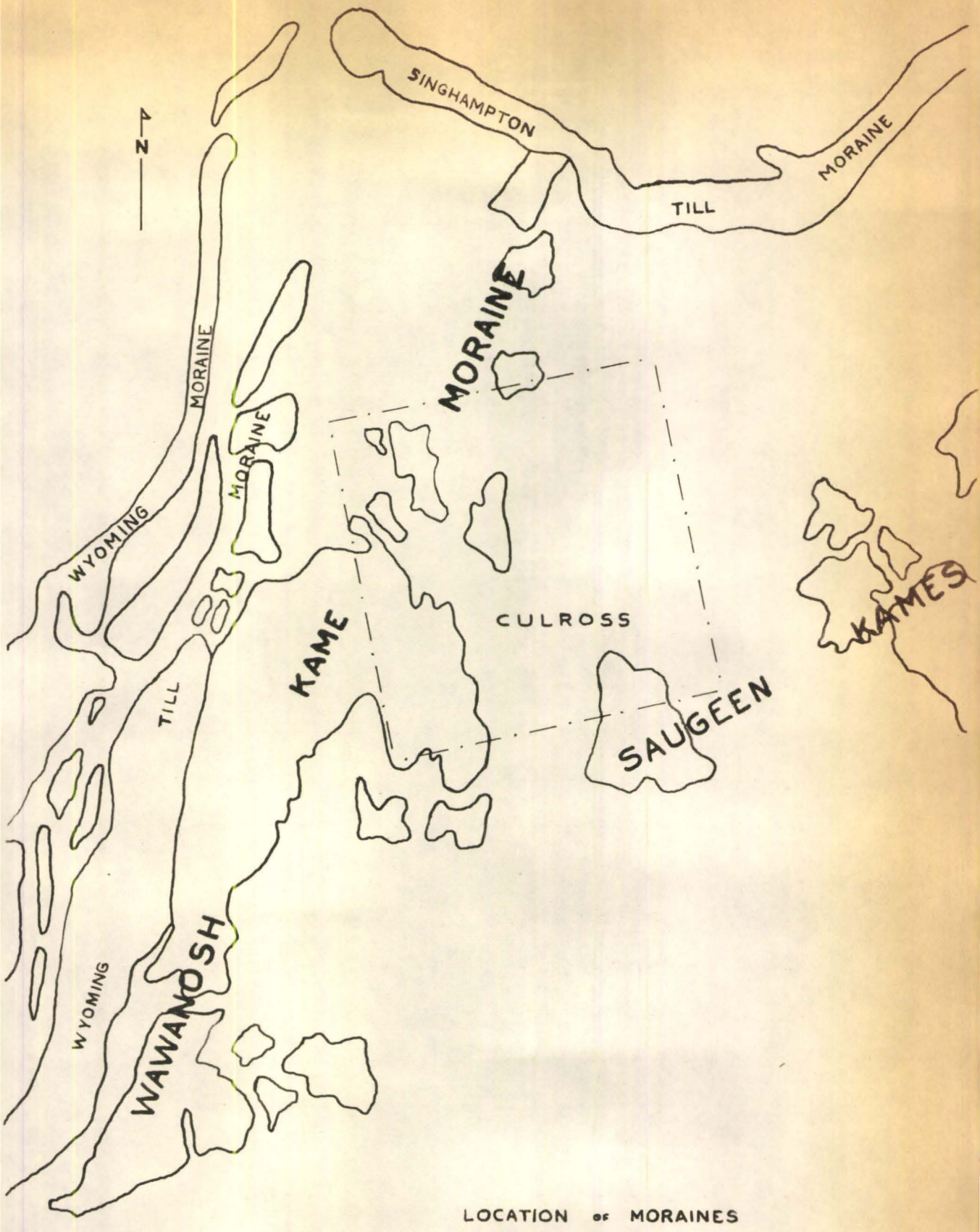
built moraines north and west of Culross (figure 9). This readvance played an important part in the forming of the present physiography of Culross as meltwater from the Georgian Bay lobe ran westward along the front of the ice toward the present Greenock Swamp area just to the north of Culross Township (figure 8, stage 2). In glacial times this area to the north was a large, shallow catch basin for glacial runoff. The runoff toward the catch basin cut spillway channels through Culross breaking up the till plain into a group of islands and dividing the kame moraines into their present unconnected forms (figure 8,stage 3).

At first these meltwaters flowed rapidly, eroding into the bedrock and depositing extensive beds of gravel on their floors. As the glacial rivers graded their courses and water was ponded in the Greenock Swamp area, the meltwater flowed less quickly and finer sands and silts were deposited on top of the previously deposited gravels. Eventually the overflow from the catch basin cut a channel southward along the front of, and through, the Wyoming till moraine (figure 9), allowing the ponded water to escape south into glacial Lake Whittlesey near the present London area (figure 7, stage 4). Since Culross was never submerged beneath a glacial lake, the physiography that had been formed has remained relatively unchanged to the present day.

Physiography

Culross Township's physiographic regions include till plain, drumlins, eskers, kame moraine, and spillways.

The western half of Culross is till plain, whose surface is gently rolling or undulating. It consists of a group of large and small



LOCATION OF MORAINES

SCALE 1" = 4 MILES

Fig. 9

disconnected sections separated by glacial spillways. Although the till plain has some poorly drained pockets, these are not extensive, and can be drained by tiles.

Since Culross lies on the margins of the main drumlin field to the south, there are only a few drumlins in the township. They are composed of moderately stony, loamy till having its origin in pale brown or grey limestone. The drumlins are mild in form with moderate slopes. Most of them occur on the rolling till plain into which they blend almost imperceptibly.

The three eskers in Culross Township, small in size and length, are not a major physiographic feature. They are all in association with kame moraines. The two eskers north-west of Teeswater (map 1) are aligned north-east to south-west, indicating their association with the Georgian Bay lobe. The third, in the south-west corner of Culross, runs more directly east-west and appears to be associated with the Huron lobe.

In the west and south-west of Culross is the area of greatest relief, the Wawanosh kame moraine (figure 9), known locally as "the Alps". The kame moraine is a complex of till and coarse fluvio-glacial material. Its highest peaks are gravelly knobs, 1025 feet above sea level. West of Belmore is a second area of kame moraine. This moraine, part of the Saugeen Kames[1] (figure 9), consists of great quantities of coarse outwash. It, too, is an area of considerable relief, but it covers a smaller area

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1. L.J.Chapman, D.F. Putnam, The Physiography of Southern Ontario (University of Toronto Press: Toronto, 1951) p.49.

than the Wawanosh kame moraine. Both kame moraines have been broken into groups by spillways.

Three main types of spillways occur in Culross, the predominate type having a broad, trough-floored valley with definite sides (figure 10). For most of its course through Culross, the Teeswater River flows in such a spillway. The second type of spillway has a narrower valley with imperceptible sides; the third type, also narrow, has steep sides. In the spillways of the latter type, glacial rivers have usually cut into the bedrock. In all types of spillways cedar swamps often occupy small depressional pockets. Silty material up to thirty inches deep covers the coarse gravel of the spillways. The gravel was deposited by swiftly flowing glacial rivers, and the silt was laid down at a latter period when the glacial rivers became sluggish.

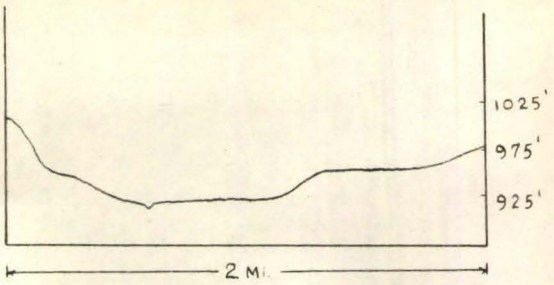
During the Wisconsin glaciation, Culross Township was scraped by ice, covered by glacial detritus, and washed by glacial rivers. Flooding of streams since the end of the Wisconsin glaciation has left depths of alluvial deposits in the stream valleys. Table 1 represents the effects of this complicated history.

The kame moraine, which is irregular and steeply sloping, occupies comparatively small area of the township, chiefly the south-west and a few other scattered section (map 1). On the other hand, the till plain and the spillways, usually gently rolling with only a few depressional areas, make up approximately seventy percent of the township. These facts have a direct bearing on the agricultural land use.

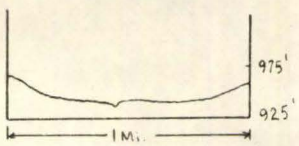
CROSS - PROFILES

OF SPILLWAYS IN

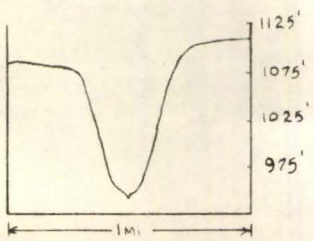
CULROSS TOWNSHIP



A WIDE SPILLWAY WITH DEFINITE SIDES



B. NARROW SPILLWAY WITH IMPERCEPTIBLE SIDES



C. NARROW SPILLWAY WITH STEEP SIDES

TABLE I

DEPOSIT (land-form)	TEXTURE OF SOIL DEVELOPED ON THIS MATERIAL	TOPOGRAPHY	STONINESS	UNDERLYING MATERIAL
glacial till. (till plain, drumlin)	loams	smooth, gently sloping.	few to moderate stones	bedrock
glacio-fluvial. (kame moraine, esker)	sandy loams	irregular, steeply sloping.	frequent stones.	sand, gravel, till.
outwash, (spill-way)	silt loams, loams.	smooth, very gent-ly sloping	stone-free.	till, gravel, silt.
organic. (swamp)	partially decomposed plant material	depression-al.	stonefree	clay, sand or till.

Photo 1. An outcrop of limestone of the Devonian System located about three miles east of the village of Teeswater on the Teeswater River. This is the grey, fine-grained, crystalline limestone, characteristic of the reef formation within the Norfolk Formation.

Photo 2. Another outcropping of Devonian limestone. This is located in Formosa village. Glacial rivers cut through the overlying drift to expose this rock.

Photo 3. The flowing well at the village of Formosa. A well drilled for oil in 1901 yielded fresh water, which has been flowing like this since then.

Photo 4. The gently rolling or undulating surface of the till plain in Culross Township.

Photo 5. This drumlin, located one mile west of Belmore, is on the edge of the kame moraine. Note the moderate slope. The stoss end is the left hand side of the picture.

Photo 6. This drumlin, located two miles north-east of Teeswater, is one of the largest in the township. Since they blend into the rolling till plain, it is difficult to photograph drumlins from afar.

Photos 7 & 8. Two photographs of one of the three eskers in Culross. This small one is located two miles north-west of Teeswater.

Photo 9. An area of kame deposits (Wawanosh kame moraine) two miles south-west of Teeswater. This is part of the area locally known as "the Alps".

Photo 10. Kame deposits in the same area as photo 9.

Photo 11. Close-up of the Wawanosh kame materials. The pen gives the scale.

Photo 12. The predominate type of spillway in Culross. It is a broad trough-floored valley with definite sides. A terrace can be seen in the foreground. This photograph shows very little of the valley itself.

PHOTO 13. A spillway of the narrow type having imperceptible sides.

PHOTO 14. This third type of spillway has a narrow valley but it has steep sides. An outcropping of bedrock, exposed by glacial rivers, can be seen beside the road in the centre of the photograph.

Climate

Culross Township, which is located at about 44° North latitude, has a humid microthermal climate with warm summers and cold winters (Dfb in the Koppen classification). Cyclonic storms, formed along the boundary between cold, dry Polar air masses to the north, and warm, moist Tropical air masses to the south, bring both winter and summer precipitation. Convectional thunderstorms, however, are responsible for most of the summer precipitation.

The following climatic data gives a more detailed look at the climate of Culross[1]. Statistics available deal with the climatic conditions observed in a weather station at Walkerton (figure 2), on approximately the same latitude as Teeswater[2]. The author, realizing that the comparison is not perfect, used these because no comparable data is available for any part of Culross itself.

TABLE II

CLIMATIC STATISTICS FOR WALKERTON, ONTARIO REPRESENTING CULROSS TOWNSHIP.

Mean Annual temperature	44° F.
Mean winter temperature	21° F.
Mean spring temperature	41° F.
Mean summer temperature	65° F.
Mean fall temperature	48° F.
Average date of late frost (spring)	May 23.
Average date of early frost (fall)	Sept.23
Longest frost-free season	163 days
Shortest frost-free season	43 days
Average frost-free season	125 days
Mean annual precipitation	38.44 in.
Mean annual snowfall	115.5 in.

1. Circular 3208, Meteorological Branch, Department of Transport, Canada 1959.

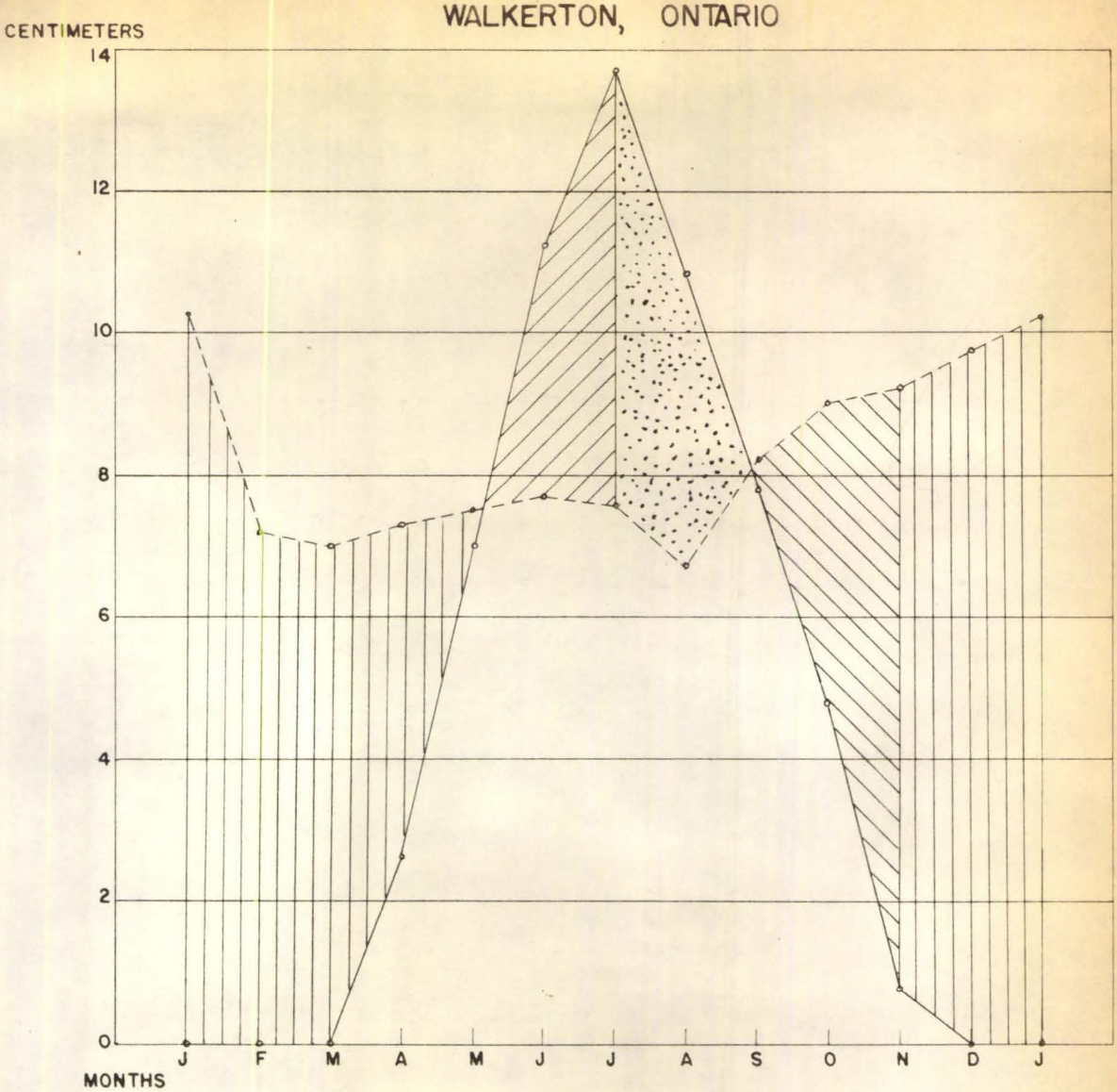
2. Teeswater -- 44°00' N. latitude, 81°17' W. longitude
   Walkerton -- 44°03' N. latitude, 81°09' W. longitude

Precipitation is usually reliable from year to year. The yearly distribution of precipitation is quite uniform, the township receiving more than two inches per month. The winter maximum (4.10 inches in January) can be attributed to the heavy snowfall, caused when air, warmed and saturated in its passage over Lake Huron, ascends the colder highlands and is sufficiently cooled to cause precipitation in the form of snow. The abundant snowfall is an advantage providing moisture for the soil in the spring and a protective covering for roots during the severe weather. About thirty years ago, a number of fine orchards in Culross were winter-killed in a year when the low temperatures came before the heavy snowfall. This helps to explain the lack of orchards and the comparatively few scattered fruit trees on the farms of Culross today.

Since Culross Township is located relatively close to the moderating influence of the Great Lakes, especially Lake Huron which lies twenty-five miles to the west, the extremes in temperature characteristic of a continental climate are, to some extent, modified here; for example, a typical continental station, such as Medicine Hat, Alberta, has a mean winter temperature of 15°F, and a mean summer temperature of 64°F. This is a contrast to the same figures shown in Table II for Culross. Climatic isopleths, particularly the monthly isotherms and isohyets, generally trend north-south through Culross, paralleling Lake Huron. This diversion from the normal east-west trend of such isopleths across most of Canada indicates the influence of Lake Huron.

THORNTHWAITE CLIMATIC GRAPH

WALKERTON, ONTARIO



legend:

PRECIPITATION

POTENTIAL EVAPOTRANSPIRATION

WATER SURPLUS

WATER DEFICIENCY

SOIL MOISTURE UTILIZATION

SOIL MOISTURE RECHARGE

A "Thornthwaite" climatic graph of Walkerton, Ontario (figure 11) is included to show the relation between the water requirements of plants and the water supply in Culross Township. Since the data is from a station about five miles east of the eastern margin of the township, the graph only approximates the moisture supply-utilization relations in soils with normal drainage in Culross. As there is a water shortage during the latter part of July, all of August, and the early part of September, cultivation of crops is limited to those whose optimum growth is reached just prior to this period; for example, small grains, corn, hay, potatoes, turnips, cucumbers, and beans.

Photo 15. The heavy snowfall in Culross blocks the sideroads. Only the concession roads are ploughed open.

Photo 16. An example of the depth of an early snowfall. Drifts from one of the first of the season, have almost buried the fence.

Natural Vegetation

Culross Township lies in the Huron-Ontario Section of the Great Lakes-St.Lawrence Forest Region[1], a region in which the prevailing association of forest trees is characterized by sugar maple, and beech.

On well-drained sites of the till plains and kame moraine sugar maple, beech, and basswood were predominant, but there were occasional ridges of hemlock, and scattered birch, cherry and butternot trees. Pine stands in these areas were small and widely dispersed. The present Greenock Swamp area, however, was described in the original surveyor's notes of 1851-1852 as an area of black ash and pine[2]; this would seem to indicate that this area contained a greater admixture of pine than did the hardwood forests in the other parts of the township. White elm was dominant on the imperfectly drained sites on both the till plains and kame moraine. The swampy depressions throughout Culross contained elm, black ash, and extensive stands of cedar and tamarack.

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1. W.E.D.Halliday, A Forest Classification for Canada Bulletin 89. Ottawa: Department of Mines and Resources; Land, Parks and Forest Brnch: Forest Service, 1937.

2. "Lower Saugeen Valley Conservation Report: Forest," Ontario Department of Planning and Development; Conservation Branch, Toronto, 1959.

Photo 17. A stand of cedar in a spillway about three miles east of Teeswater.

Photo 18. Looking west through the Greenock Swamp. The predominant tree association is white elm and black ash. The elm are away from the edge of the road.

Soils

The main influences on soil development in Culross Township have been climate, vegetation, and relief and drainage. Bedrock, too, has influenced soil development, but only indirectly: the limestone bedrock has produced the calcareous till of the till plain, drumlins, and some pockets of the kame moraine. Although the till plain and the kame moraine are older than the alluvial and bog deposits, yet the soils of Culross can be considered youthful.

Four Great Soil Groups comprise the soils of Culross Township: the Grey-Brown Podzolic, the Dark Grey Gleisolic, the Alluvial, and the Bog.

The vegetation and climate of Culross were conducive to the development of a zonal soil known as the Grey-Brown Podzolic Great Soil Group. The process of podzolization demands an accumulation of organic matter whose decomposition will produce acids that percolate down and leach the upper part of the profile to produce the characteristic bleached ash-grey zone. Harriston loam and silt loam, Listowel loam, Dumfries loam, Donnybrook sandy loam, Teeswater silt loam, Waterloo sandy loam, Burford loam, Brisbane loam, and Brady sandy loam all belong to the Grey-Brown Podzolic Great Soil Group.

Formed from loamy, calcareous till the Harriston loam is found in association with the till plain and drumlins (maps 1 and 2). Since the land is moderately sloping, Harriston loam has good internal and external drainage.

PROFILE OF HARRISTON LOAM

Ao - Thin layer of partially decomposed leaves, twigs, etc.

A1 - 0-4 inches loam; dark greyish brown; fine granular structure;few stones.

A21 - 4-17 inches loam; yellow-brown; weak platy structure; stone-free.

A22 - 17-20 inches loam; pale brown; weak platy structure; stone-free.

B2 - 20-30 inches clay loam; brown; medium nuciform structure;few stones.

C - Loam till; light yellowish brown; medium nuciform structure; moderately stony.

Harriston silt loam, also found in association with the till plain, occupies a small area in the south-west (map 2). Listowel loam, occurring in close association with the Harriston loam on the till plain, has imperfect external and internal drainage because of its smooth or very gently sloping terrain.

In Culross Township, Dumfries loam, occurring in the kame moraine area, especially in the south-west (map 2), has developed on grey, calcareous, stony till. Since the topography is irregular and steeply sloping, external and internal drainage are both good. Donnybrook sandy loam occurs in a large area in the west of Culross and in smaller areas around Teeswater south-east to Belmore (map 2). This soil, like Dumfries loam, occurs on the irregular, steeply sloping topography of the kame moraine. Donnybrook sandy loam has developed on sand and gravel. Its natural drainage is good.

PROFILE OF DONNYBROOK SANDY LOAM

Ao - Thin layer of partially decomposed leaves, twigs, etc.

A1 - 0-4 inches sandy loam; dark grey-brown; fine crumb structure; few to frequent stones.

A21 - 4-13 inches sand; yellowish brown; weak platy structure; gravelly.

A22 - 13-17 inches sand; pale brown; single grain structure; gravelly.

B2 - 17-23 inches sandy loam; dark brown; weak nuciform structure; gravelly; very stony.

C - Sand and gravel; very pale brown; single grain structure; calcareous; very stony.

The well-drained Teeswater silt loam occurs, for the most part, in the glacial spillways, particularly the Teeswater River spillway. Smooth, gentle slopes characterize the topography of areas of this soil type. Teeswater silt loam has developed from silty alluvial deposits over gravelly outwash material.

PROFILE OF TEESWATER SILT LOAM

Ao - Thin layer of partially decomposed leaves, twigs, etc.

A1 - 0-4 inches silt loam; dark greyish brown; fine granular structure; occasional stones.

A21 - 4-16 inches silt loam; light yellow-brown; fine platy structure; stonefree.

A22 - 16-19 inches silt loam; pale brown; weak platy structure; stonefree

B2 - 19-31 inches Clay loam; dark brown; medium nuciform structure; moderately stony.

C - Sand and gravel; very pale brown; single grain structure; calcareous.

Waterloo sandy loam, on very steeply sloping terrain, occurs in only a few small areas of Culross (map 2). This well-drained soil, developed on sandy material with occasional pockets of gravel, is found in association with sides of spillways. Burford loam, too, occurs in only a few small areas, likewise in association with thespillways. This soil, developed on well-sorted sandy and gravelly materials, is well drained. Another soil type in association with the spillways is imperfectly drained

Brisbane loam, which has developed in areas of smooth, very gentle slopes on areas of sand and gravel. Imperfectly-drained Brady sandy loam also occurs in small areas in the spillways. This, too, has smooth very gently sloping topography on sand and gravel.

Considerable proportions of the soil of Culross, however, have been developed under poor conditions of drainage: Parkhill loam, Gilford loam and Muck, introzonal soil types of the Dark Grey Gleisolic and Bog Great Soil Groups; and Bottom Land, an azonal soil of the Alluvial Great Soil Group.

Parkhill loam occurs on the gently sloping to depressional areas of the till plain. It is a poorly drained soil developed on calcareous till.

Gilford loam, a poorly drained soil occurs in only a few small areas of Culross, in association with very smooth to depressional areas of the spillways.

Muck soils are well decomposed organic matter and are dark in colour. They occur in depressional topography, especially in the spillways in the north-west, and in pockets in the kame moraine in the south-west of Culross.

Bottom Land is the term used to refer to the low-lying soils along stream courses. These immature soils, subject to flooding, are formed of materials only recently deposited. Bottom Land consists of layers of silt, sand and clay, intermixed with layers of organic matter. Usually there is a gradation of colour from very dark grey to grey from the surface downward.

Soils on the gently sloping areas of the till plain and spillways, and those on the irregular and steeply sloping kame moraine are generally well drained. In these areas, smooth or depressional

terrain is imperfectly or poorly drained. The loams and silt loams, which predominate, are medium textured; the sandy loams are fine.

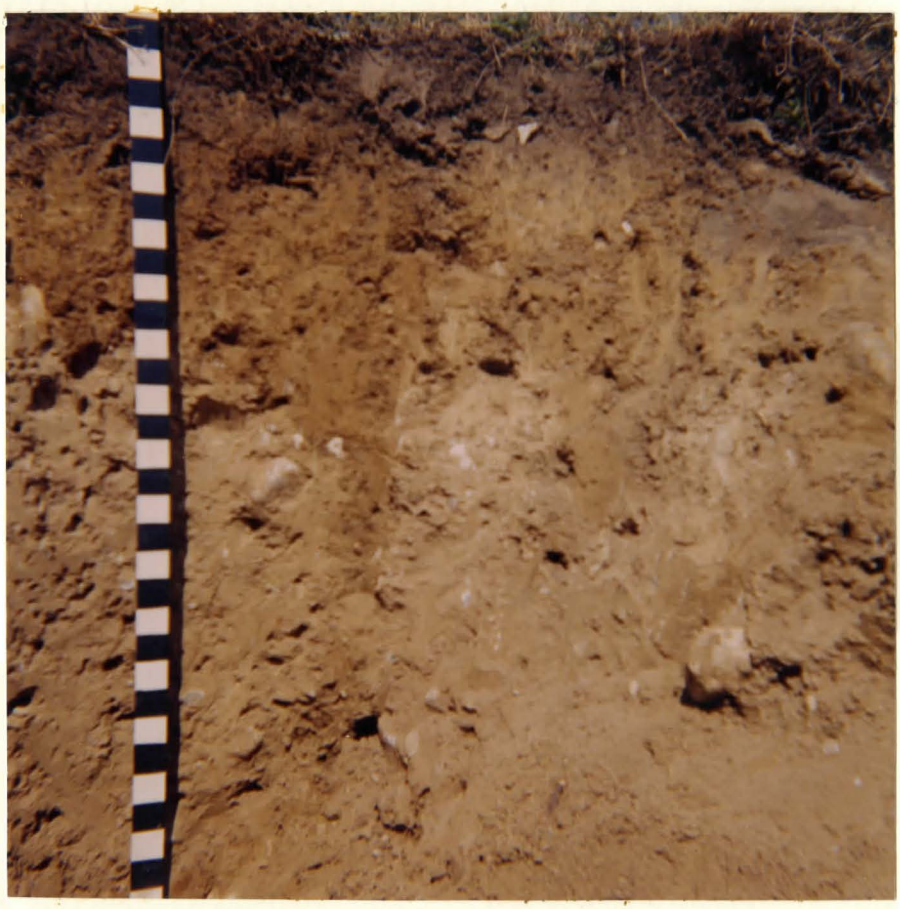

Photo 19. Soil profile of Harriston loam. Each square is one inch.

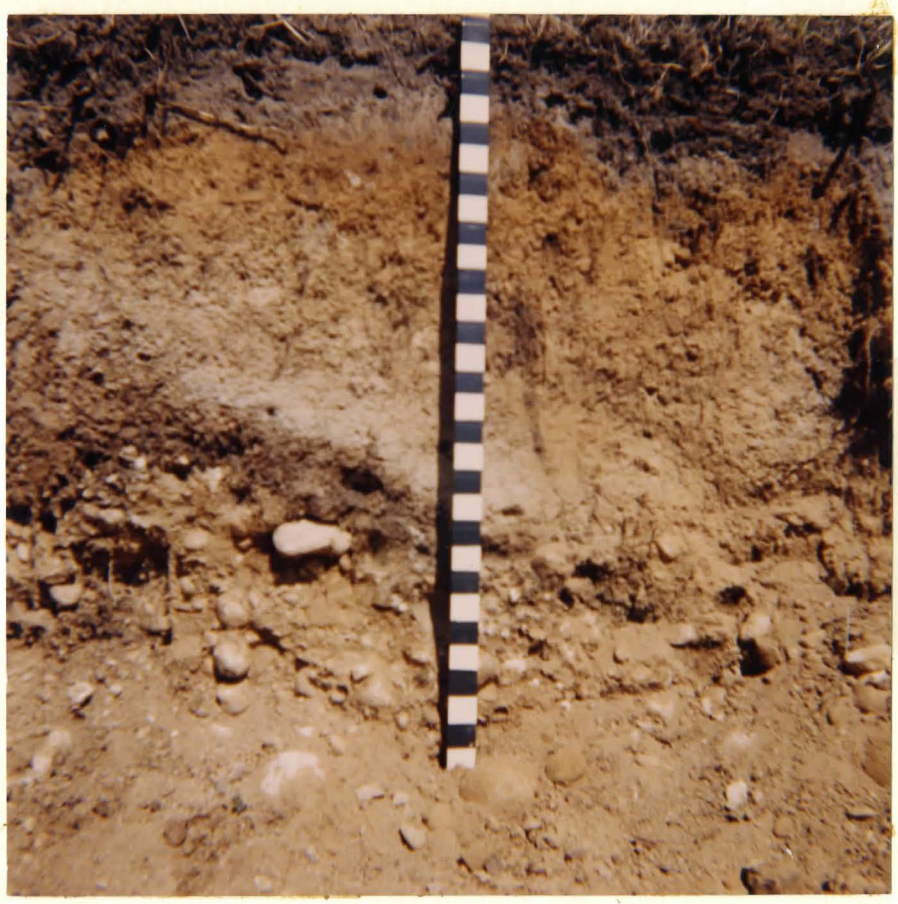

Photo 20. Soil profile of Donnybrook sandy loam.

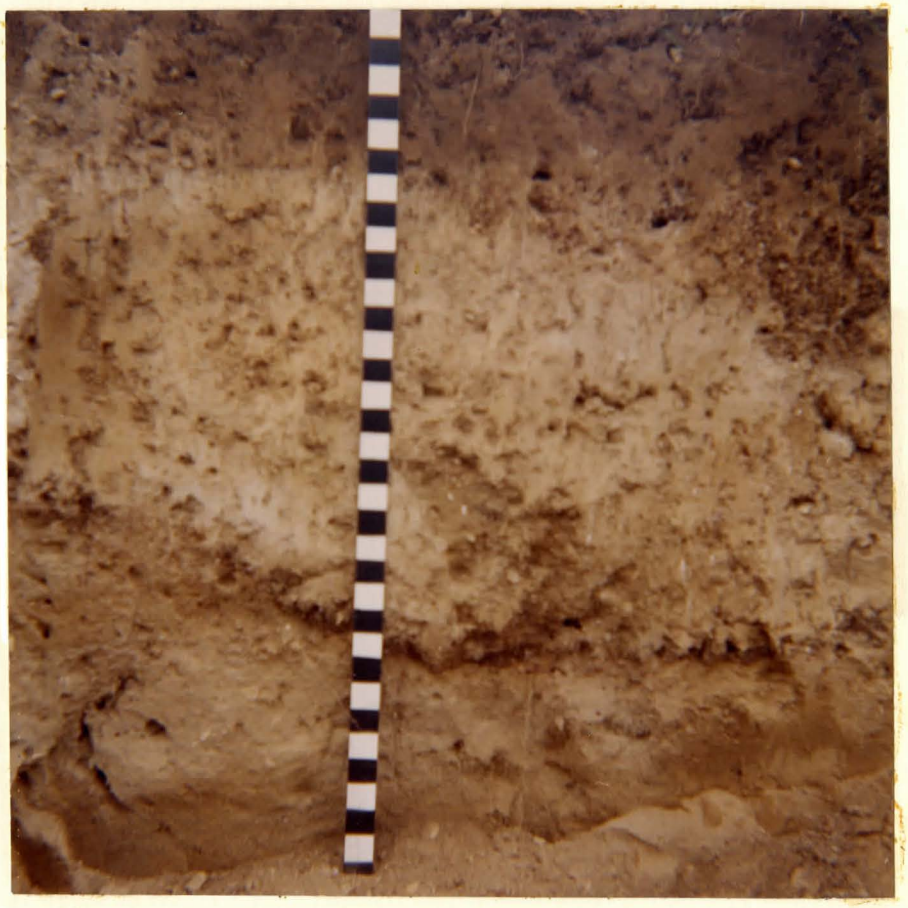

Photo 21. Soil profile of Teeswater silt loam.

CHAPTER II

HISTORICAL GEOGRAPHY

I. Culross Township and Indian Occupation

The first known inhabitants of Bruce County were Indians. The first French explorers and Jesuit missionaries found members of the Wyandotte tribe along the Lake Huron shore, and later, when the Wyandottes were conquered by the Iroquois, the latter also stayed close to Lake Huron. Although they probably travelled through Culross, no definite evidence exists that they lived there.

The last Indians in the present Bruce County area were the Ojibways. Evidence of their penetration inland (probably by way of the Saugeen River) perhaps as far as Culross, comes from the name they gave to the present Teeswater River, a tributary of the Saugeen. They called it "ahtayahkosibbi" which means "the drowned lands river"[1], in reference to the swampy area through which it flows. Yet, no clearing of land or settlement inland was undertaken by the Ojibway, for the forest was very dense and the area of present Culross Township was not on any of their trade routes. It was the white man who set the patterns of settlement, and changed the physical character of Culross Township.

II. Period of Survey and Settlement

The Ojibway Indians signed a treaty with Sir Francis Bond Head in 1836, turning over to the Crown a tract of land comprising the original County of Bruce, and including Culross Township. The treaty

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1. L. N. Robertson, The History of the County of Bruce (William Briggs: 1906) p.13.

insured a peaceful co-existence between the Indian and the white settler and paved the way for settlement.

Most of the aforementioned tract came to be known as the "Queen's Bush"[1] in order to distinguish it from lands of the Canada Company and the German Company, two land companies which owned territory in Upper Canada at this time. By the 1840's the population increase in Upper Canada warranted the opening and settling of the Queen's Bush. Several roads were, therefore, laid out and townships surveyed.

Culross was named after an English estate of Lord Elgin, Governor-General of Canada when the survey of the township was made in 1852. Fifteen concessions running east-west and thirty-five lots running north-south were surveyed, and allowance was made for a road along every second concession and every fifth lot line. No road was cut through the township at this time, but the Durham Road (figure 20) running from west to east (from Durham through Walkerton to Kincardine on Lake Huron) lay almost along the northern boundary. This road could be used by settlers moving into Culross.

In 1854, lands in Culross were opened for settlement[2]. Most of the first settlers were of Scotch, Irish, and English origin, though some of German origin, from the County of Waterloo,Ontario, settled in the north-east of the township. The settlers were primarily interested in obtaining land for farming.

Early settlers were attracted to land which dried out early

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1. Robertson, p.10

2. Robertson, p.344

in the spring. The hilly areas in south-west Culross, especially the south-facing slopes, met this requirement and were, therefore, occupied first. Much of the land along the Teeswater River, particularly the Teeswater silt loam, is also well drained, and thus received settlers very early. The Harriston and Listowel loam areas, comparatively cold and wet in the early spring, were settled later, for they seemed less desirable. There was no main settlement road through Culross in this period of settlement, only the concession roads. Although settlement followed these to some extent, travel was difficult. Yet population grew apace; for when the first census was taken in 1861, Culross had approximately 2,500 people and 394 farms.

In the early years of settlement, the pioneer settlers cleared the land, using teams of oxen to pull out the stumps; they built log houses and barns, and constructed crude stump or brush fences. On the small clearings they planted wheat, oats, potatoes, and turnips as food sources, and pastured a few cattle and sheep on small areas of the cleared plot to provide meat, milk, and wool for their families. From the remaining forest land surrounding the log house, they obtained both game for food and fuel for heating and cooking.

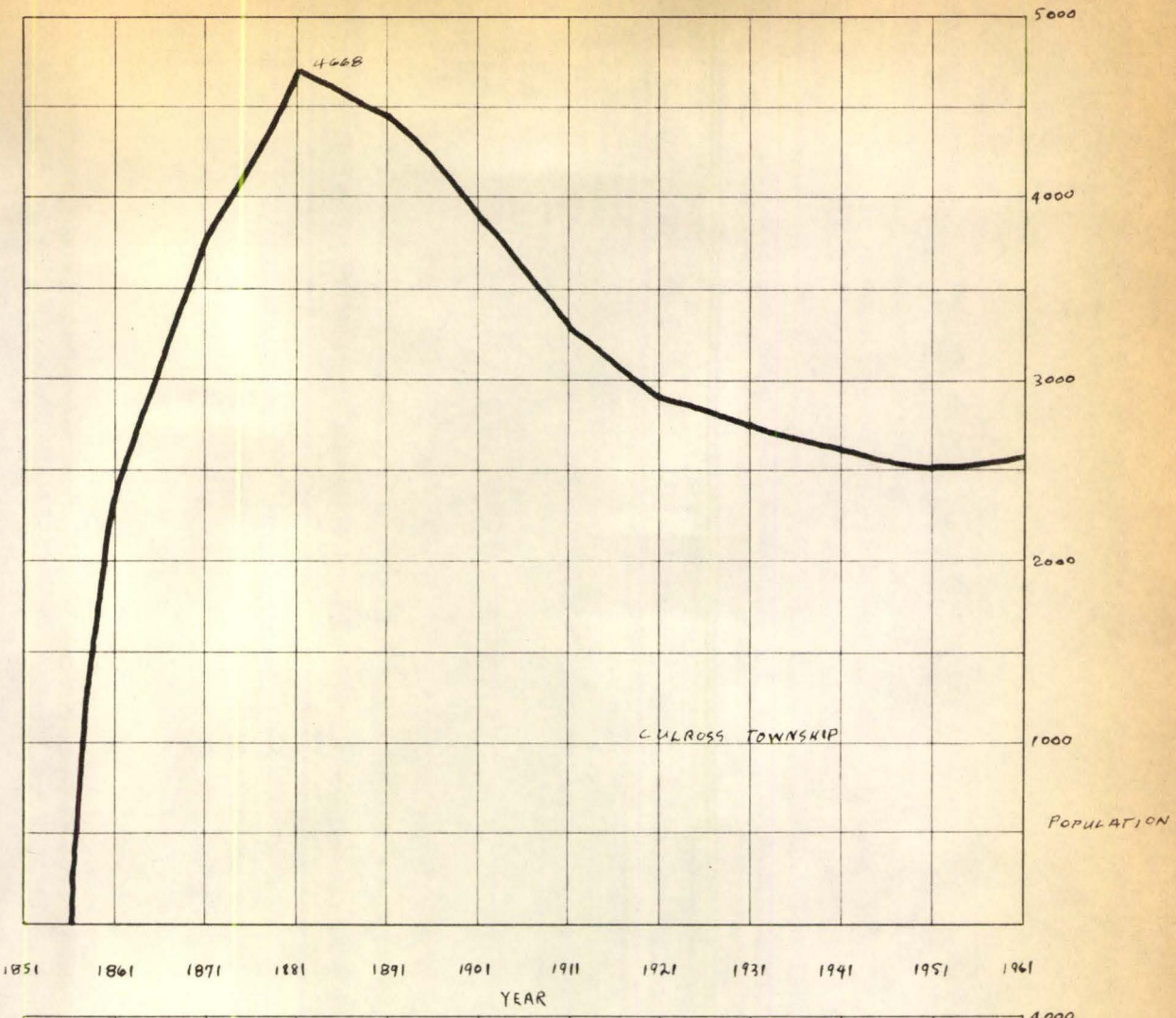
Railways and improved roads did not come until later. The only means of getting to the nearest grist mill, in Clinton approximately thirty-five miles south, was by cart or foot along rough trails.

III. Period of Growth, 1856 - 1881

From 1856 to 1881 Culross experienced its maximum growth in population (figure 12). The beginning of this period was marked by the establishment of a grist mill in 1856 and a saw mill in the following year. Since the Teeswater River had a fall of about eight feet across two lots on Concession VI, and the river maintained a fairly uniform flow through all seasons, Peter Brown established these two mills on the river where today Teeswater, the largest urban centre, is situated. This was the beginning of Teeswater. Population and farm occupance grew rapidly until 1881. Roads were built and improved, and a railway reached Teeswater. No longer was the settler comparatively isolated on his farm. As markets were opened to him, he expanded his clearings to produce wheat, oats and livestock. The graphs on population, land use, crops, livestock, and ownership trends (figures 12, 13, 14 15 and 16) illustrate the rapid growth during this period, 1856 - 1881.

In this quarter century the economy of Culross underwent considerable diversification. Agriculture was still the main pursuit. In 1881, out of the township's total area of 57, 835 acres, a maximum of 57,478 were owned by individual proprietors (figure 13). Approximately 62% of this land was cleared for agricultural purposes, but each farm still retained some forest cover. The forest, however, had been steadily decreasing (figure 13).

A comparison with figure 17 and figure 18 shows that rapid settlement was taking place. In 1857 at the beginning of this period, settlement followed the pattern set during the land sales in 1854:


4668
5000
4000
3000
2000
1000
CULROSS TOWNSHIP
POPULATION
1851
1861
1871
1881
1891
1901
1911
1921
1931
1941
1951
1961
YEAR

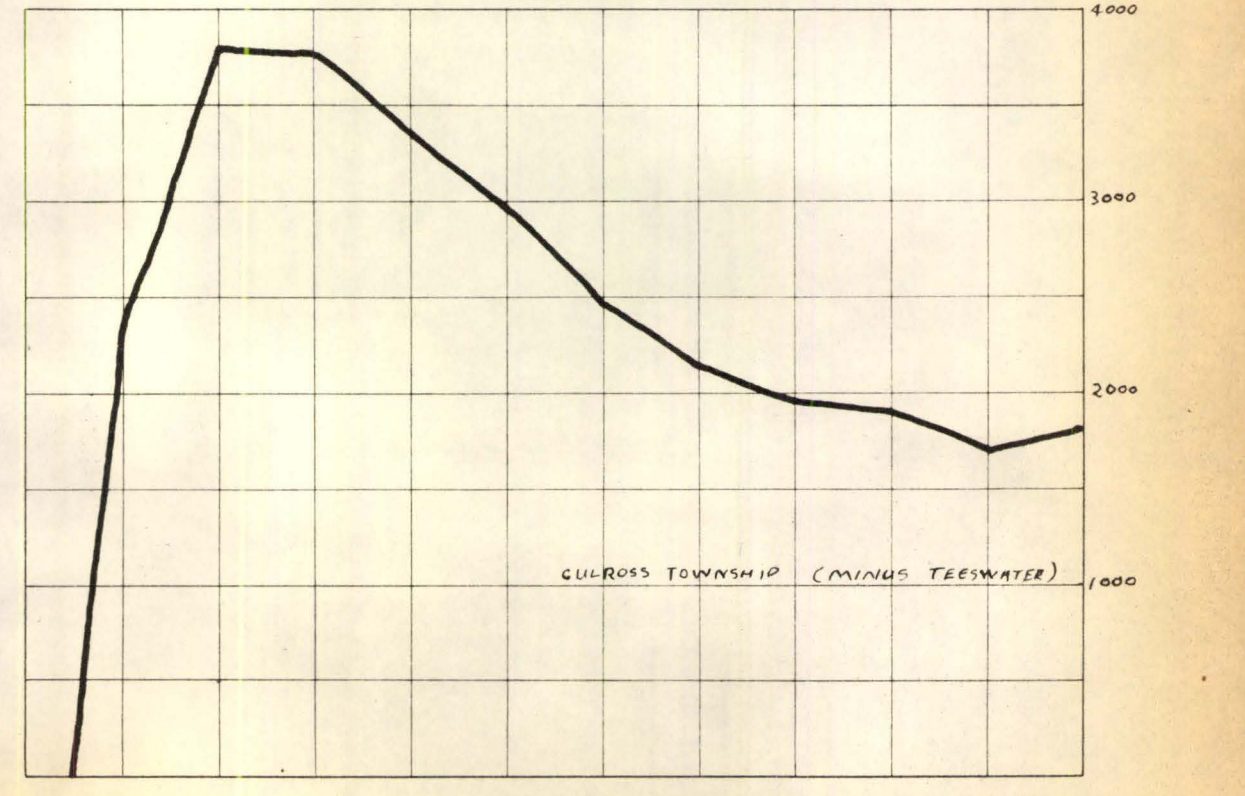

4000
3000
2000
1000
CULROSS TOWNSHIP (MINUS TEESWATER)

Fig. 12

LAND USE

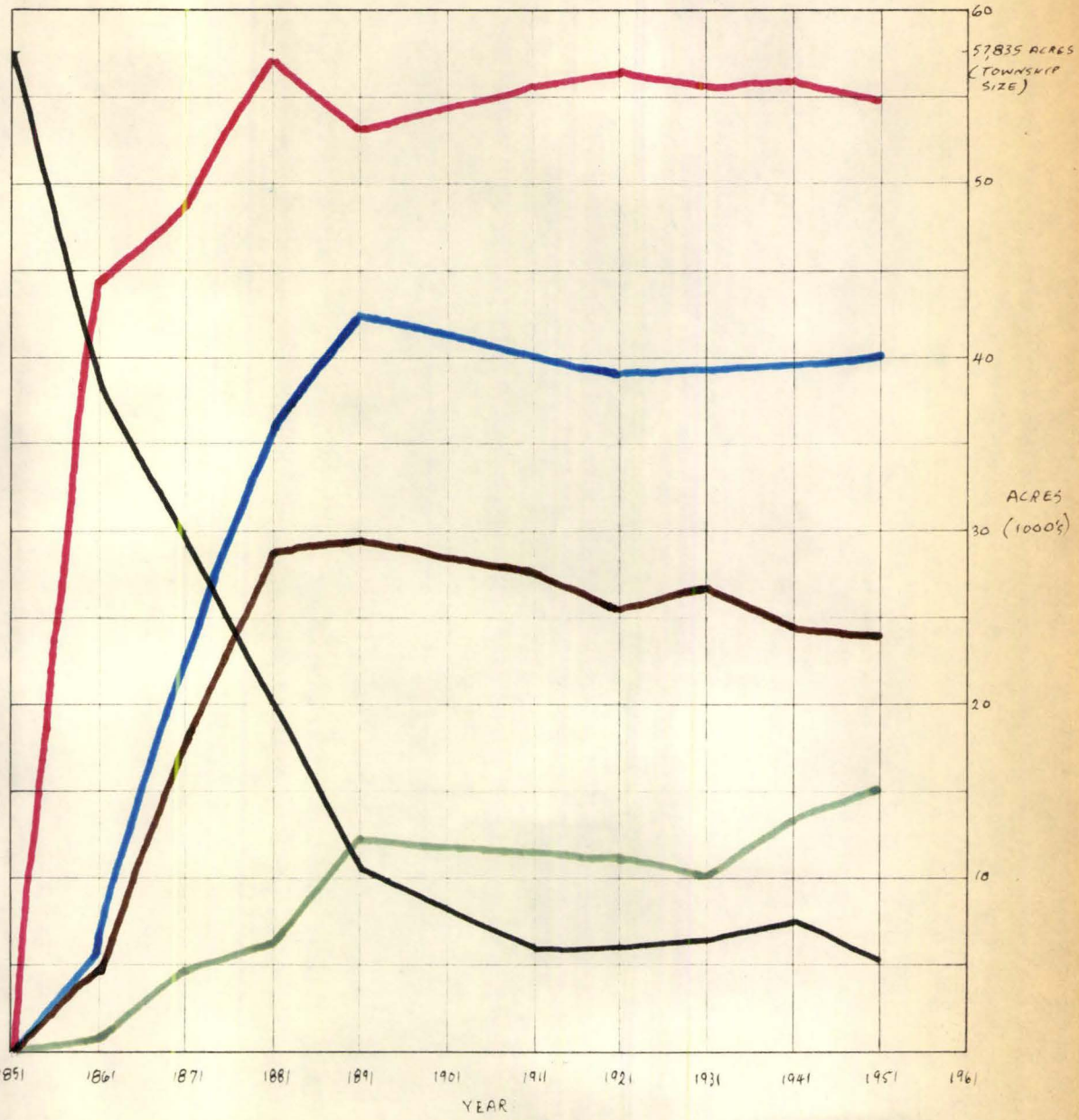


FIG. 13

CROPS

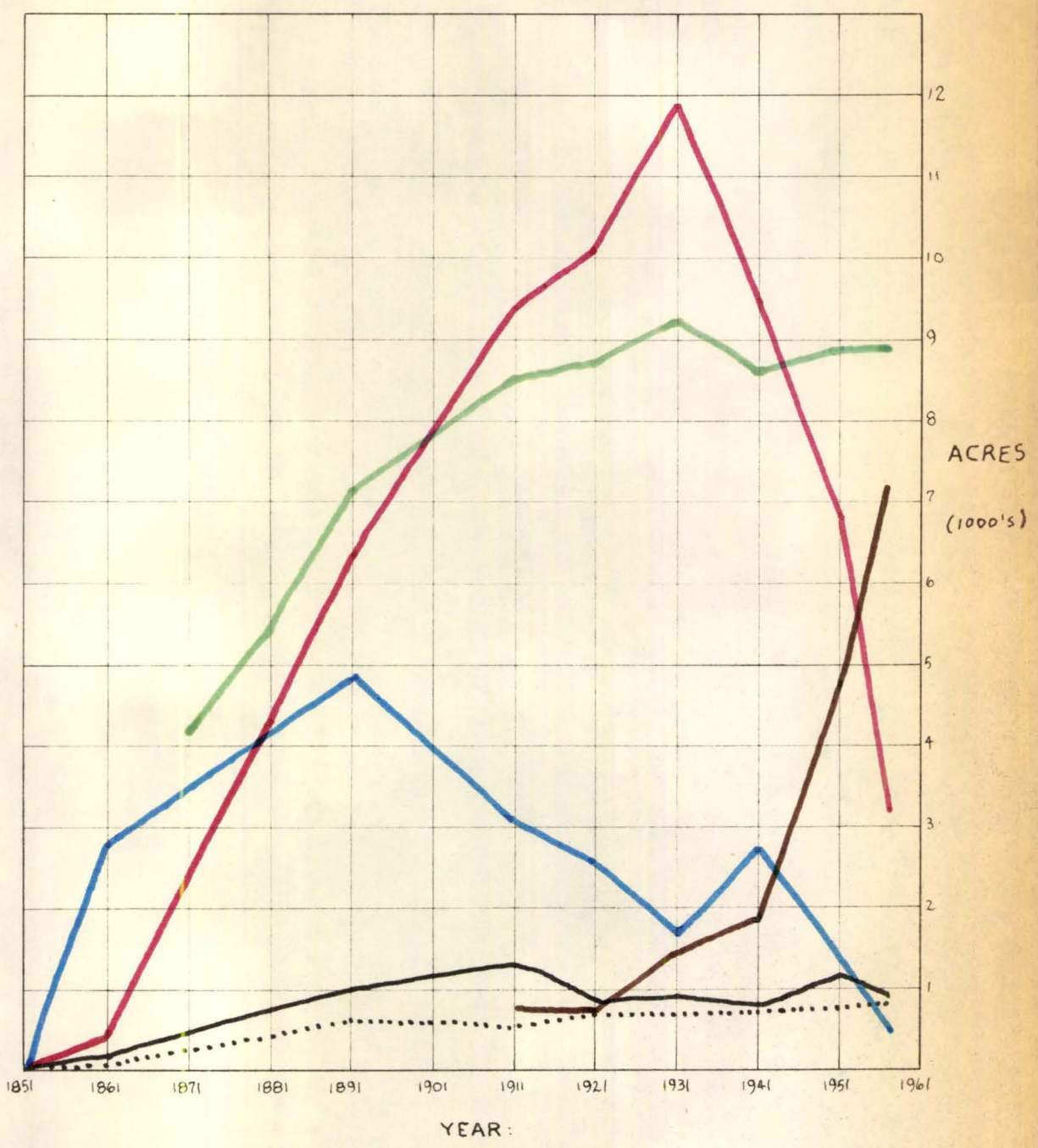

12
11
10
9
8
7
6
5
4
3
2
1
ACRES
(1000's)
1851
1861
1871
1881
1891
1901
1911
1921
1931
1941
1951
1961
YEAR:
BARLEY
CORN
HAY
MIXED GRAINS
OATS
WHEAT

FIG. 14

LIVESTOCK

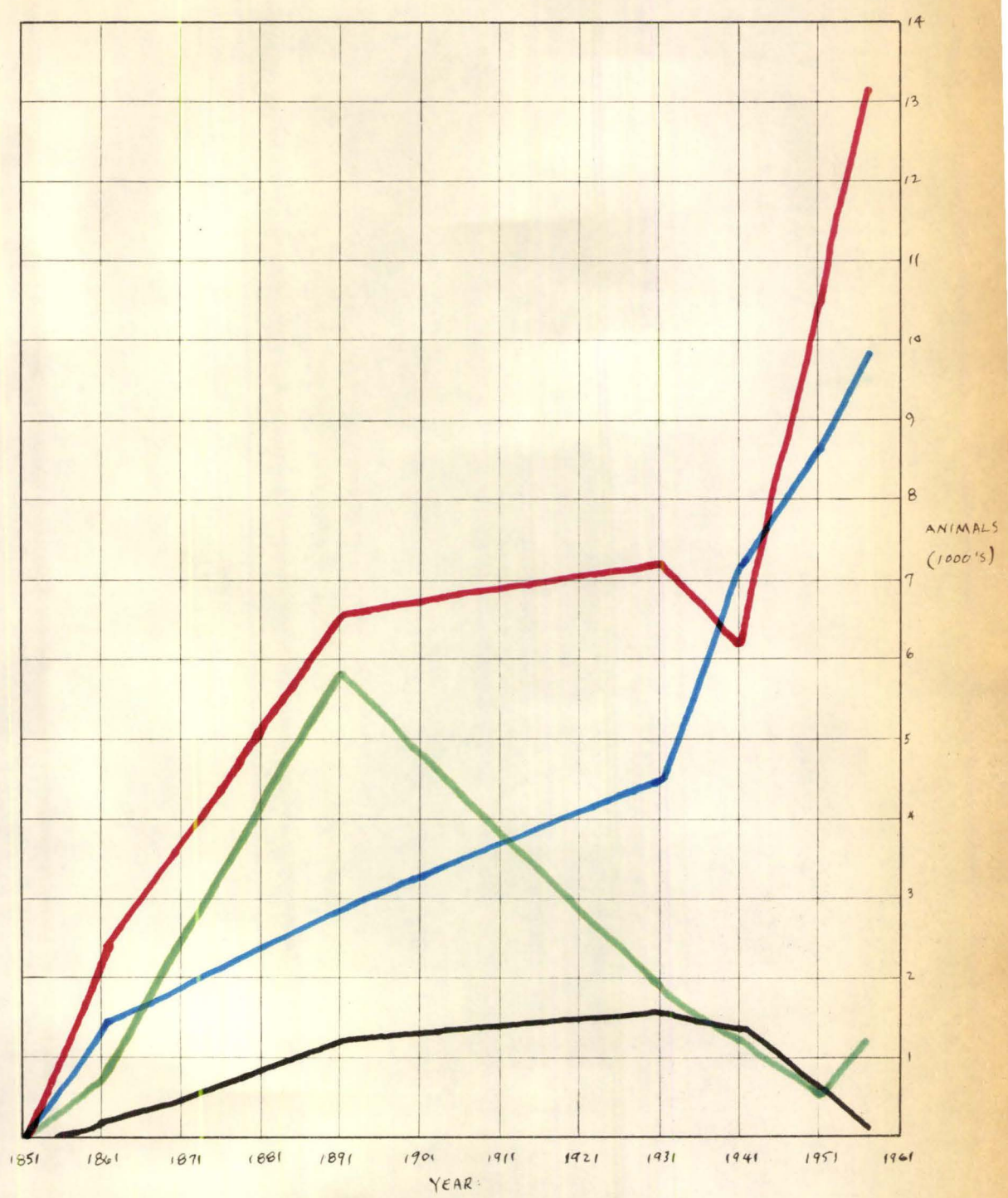
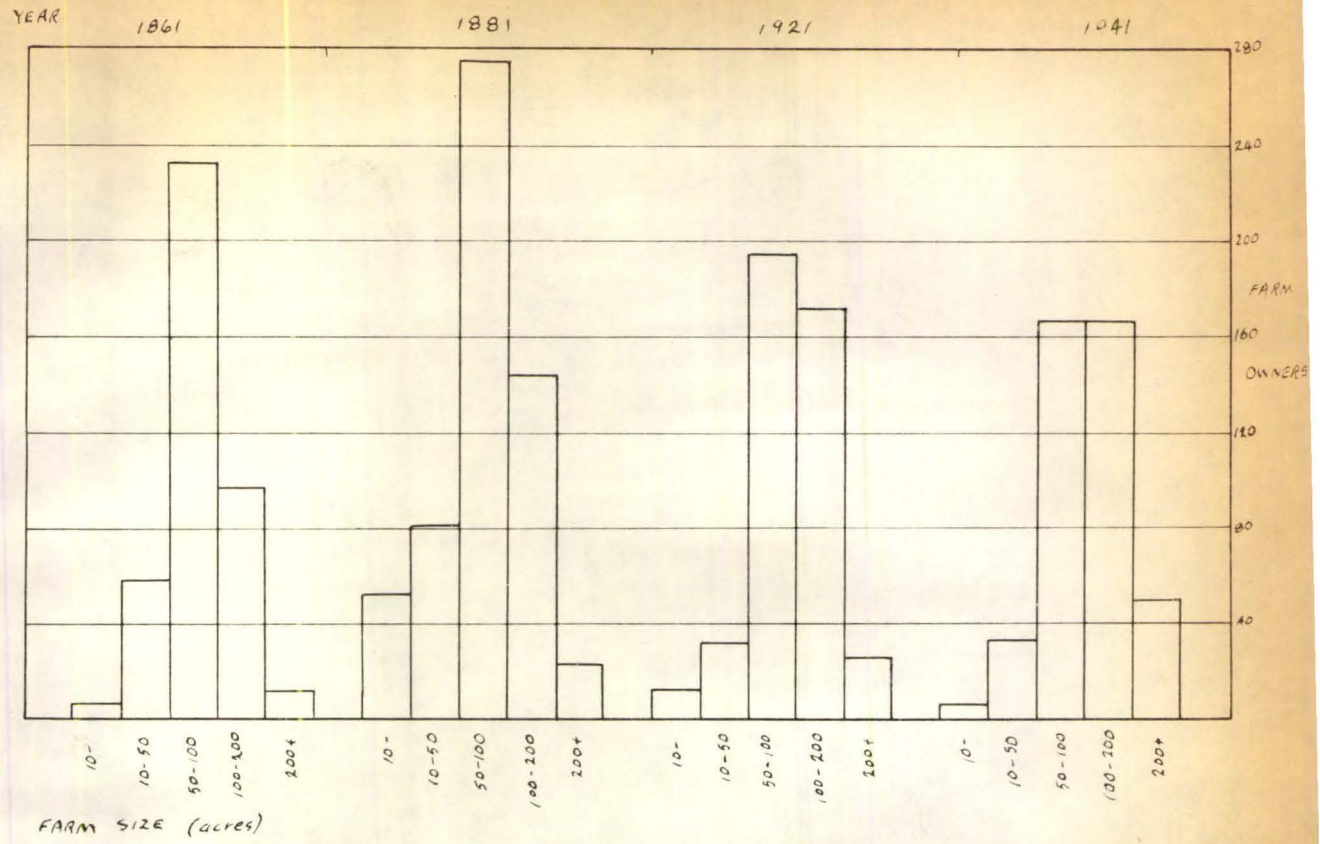


FIG. 15


YEAR
1861
1881
1921
1041
280
240
200
160
120
80
40
FARM
OWNERS
10-
10-50
50-100
100-200
200+
FARM SIZE (acres)

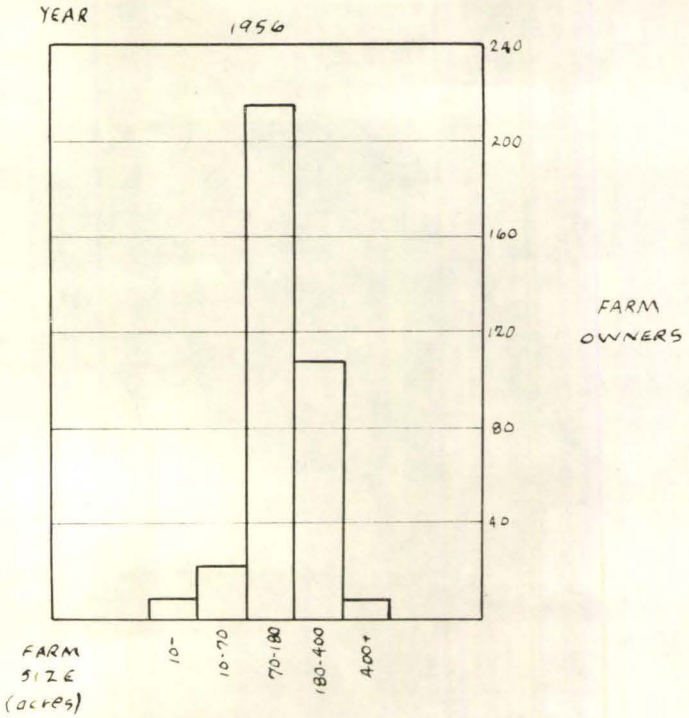

YEAR
1956
240
200
160
120
80
40
FARM
OWNERS
FARM
SIZE
(acres)
10-
10-70
70-180
180-400
400+

FIG. 16

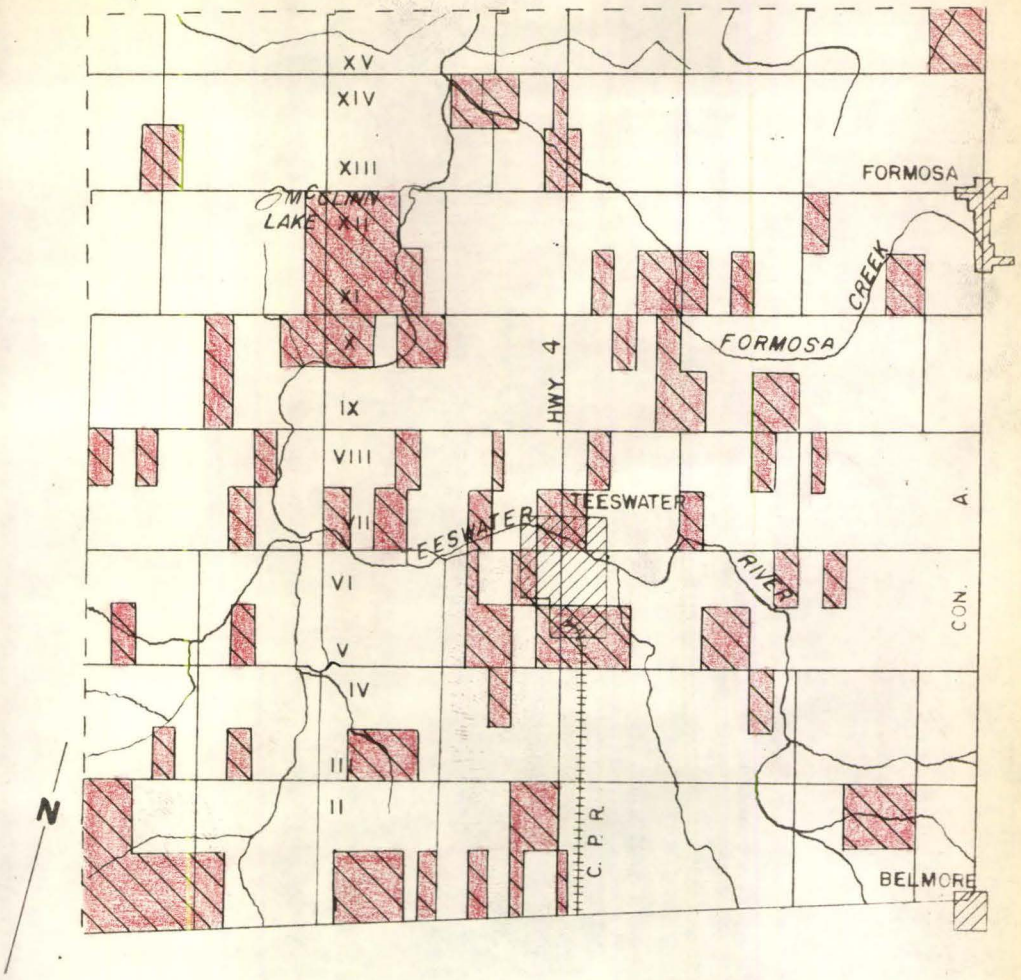
Hilly lands in the western portion and the area around the Teeswater mills, were settled first. By 1867, however, most of the good land had been purchased and settled. Lots had also been abandoned in this ten-year period (figures 17 and 18). Some of the abandoned lots were on poorly drained soils, but others were on well-drained Harriston loam. Sickness or death, which were inevitable by-products of the hardships of pioneer life, probably caused the temporary abandonment of the farms on the Harriston loam.

Farmers were changing their holdings from the small farms (10 to 50 acres), which had predominated in the 1850's, to farms of 50 to 200 acres in the period 1856 - 1881. Farms of more than 200 acres increased slightly in number, but were still not numerous. The larger fields were being completely cleared of stones and stumps; fences of stone and split rails replaced most of the brush and stump fences of the former period. Rail fences were the more common, especially where cedar stands were still present to provide the rails, and many of these fences remain today.

Frame or brick houses were replacing the log cabins of former times. Substantial frame barns on good stone foundations replaced the assortment of small log buildings which had formerly served as barns and storage sheds.

Until just before 1880, wheat remained the most important field crop. Any surplus that was produced for market at this time was transported by horse and wagon south to Clinton, the nearest railway centre until 1854, from where it was shipped to Toronto. In 1874, when

CULROSS TOWNSHIP

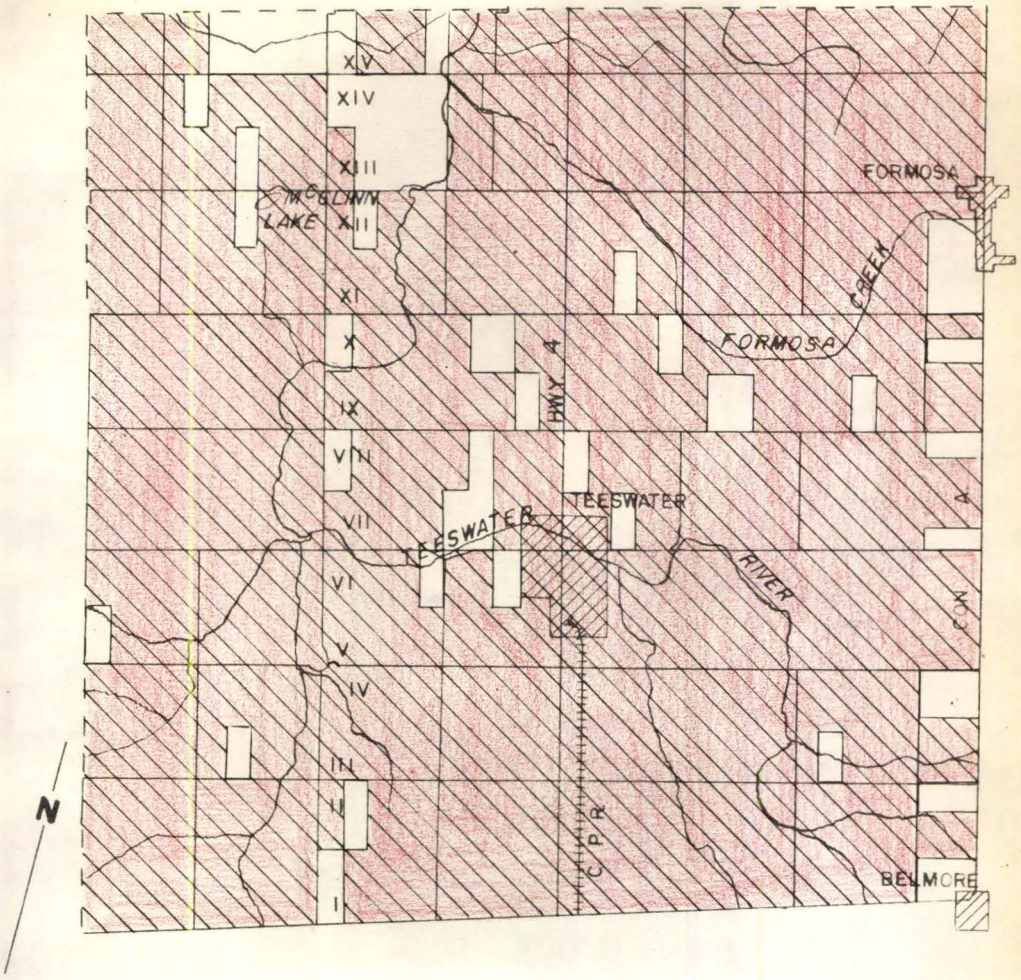


LEGEND

AREA SETTLED BY 1857

FIG. 17

CULROSS TOWNSHIP



1 1/2 0 1 2 3

SCALE IN MILES

LEGEND

AREA SETTLED BY 1867

Fig. 18

the railway came into Teeswater, the farmers were spared the long trip to Clinton. Wheat for local use was milled at the grist mill at Teeswater, or at one of the other two which had been established in other parts of Culross (figure 19). Oats gradually replaced wheat as the most important field crop in the township; horses were replacing oxen as the main draught animal on the farms, and oats was their primary feed. Hay cultivation became important during this period. In 1881, the wheat acreage was about 4,100 acres (160,000 bushels); oats, about 4,250 acres (130,000 bushels); and hay, 4,192 acres (figure 14).

From 1856 to 1881, the raising and breeding of livestock, especially cattle and sheep, showed a marked increase (figure 15). The improved transportation facilities and the expanding urban centres to the south-east made more markets available to the Culross farmers. During this period, moreover, there was an improvement in the quality of the livestock. Some of the township's farmers obtained a provincial reputation in their several specialties; for example, Henry and Peter Arkell for their breed of sheep.[1] The higher prices at the market for high-grade stock, and the farmers' possession of larger, fenced pastures and more plentiful fodder account for this improvement.

Because a rich forest store existed in Culross, and there was considerable local demand for lumber for building operations, some of the earliest settlers established saw mills. An extremely important source of building material for the early settlers of the area was the great swamp region of north-western Culross (map 3) along the Teeswater River. By 1881, therefore, a total of six saw mills had been established.

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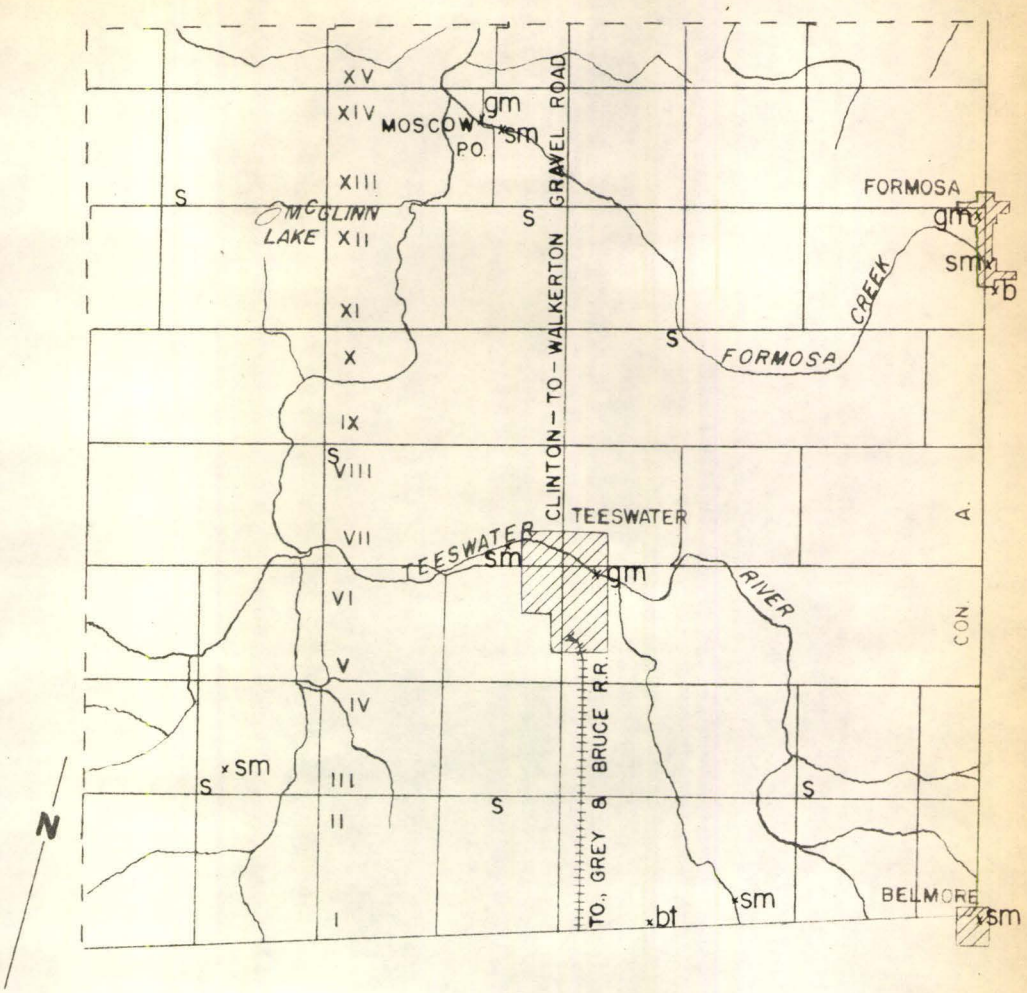
1. Robertson, p. 353

CULROSS TOWNSHIP



1 1/2 0 1 2 3

SCALE IN MILES

CULROSS TOWNSHIP

PRIOR TO 1881

LEGEND:

gm	GRIST MILL
sm	SAW MILL
b	BREWERY
bt	BRICK AND TILE MANUFACTURE
S	SCHOOL

FIG. 19 G.W.S.

Most of these saw mills were built on streams (figure 19); only one, a steam saw mill in the south-west, did not need running water. Another industry serving local needs and established in this period 1856-1881, was a brick and tile plant, which provided tile for draining fields and brick for building homes, schools, etc.

Culross Township's first schools were built before 1881, three of these on Concession II, one on Concession VIII, one on Concession X, and two on Concession XII (figure 19).

Three early roads were especially important: the Clinton-to-Walkerton Gravel Road, now Highway 4, connected the Durham Road with Clinton and London; the Culross-Carrick Road served the eastern portion of Culross (figure 20); and a road along the southern boundary connected the Elora Road, which ran through Carrick Township to the Wawanosh Road, which ran southward from Lucknow to the lands of the Huron Tract. Other concession and sideroads in Culross were simply dirt roads with a log or plank base where the road crossed a swampy area. Since the lot lines in the township ran north-south, farm houses were established along the concession roads, which supplied adequate access. In areas where the terrain was rough or swampy, therefore, sideroads were not cut through between the concessions. This accounts for gaps in the sideroads (figure 19); for example, gaps to the north-east of Teeswater were left where the deep valley of the Formosa Creek made building sideroads impractical.

Teeswater, founded in 1856 around the nucleus of Peter Brown's saw and grist mill, experienced its most rapid growth in this period, 1856-1881 (figure 21).

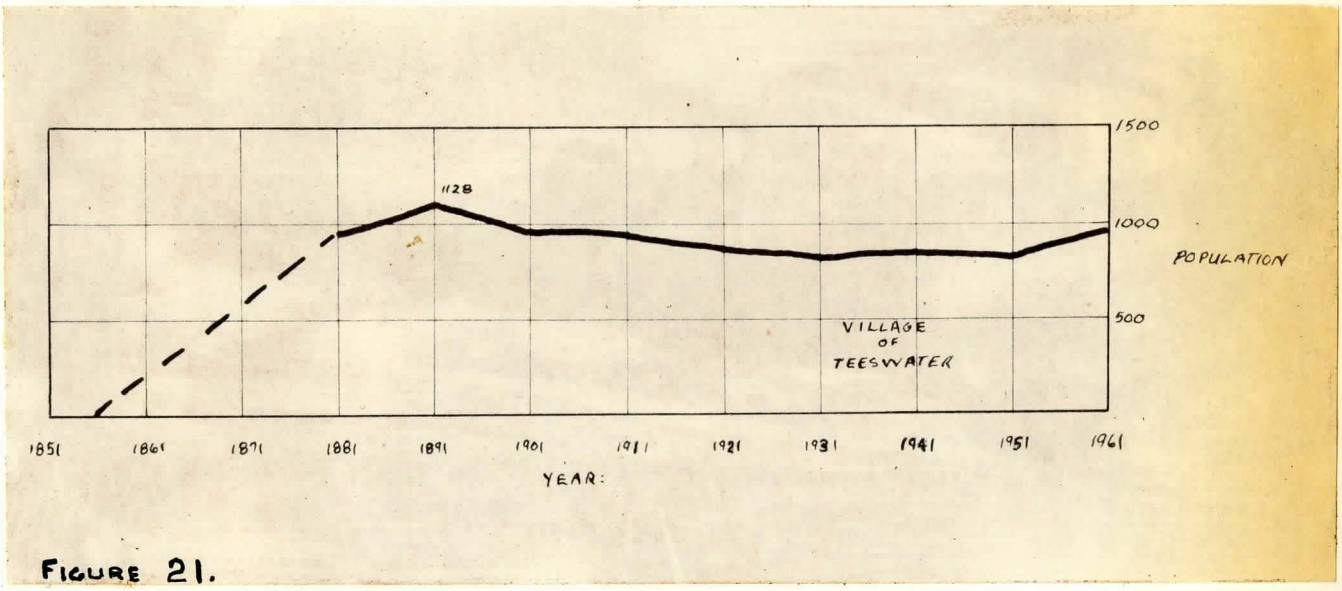
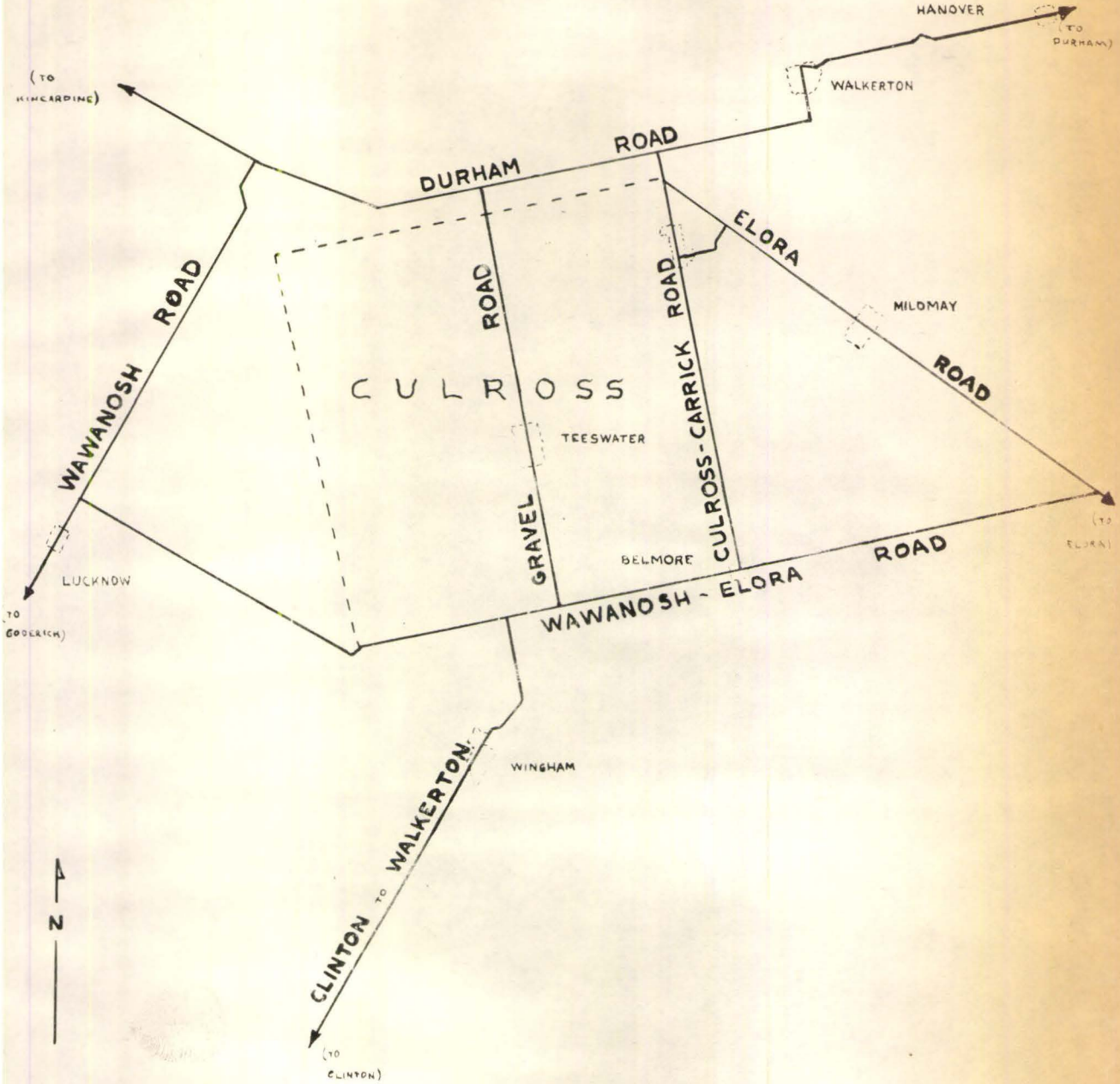


FIGURE 21.

The mills gave impetus to growth of population which in turn attracted new industries. A pearl ash (potash) factory was set up to utilize the large amounts of ashes that came from the burning of the trees which had been cut to make crop land in the township. The year 1868 saw the establishment of a foundry and a woollen mill. The former produced iron stoves and farm implements, the latter utilized local wool, there being 3,500 sheep in the township at this time, and produced woollen blankets. In 1877, the foundry and implement works, known as the Bruce Agricultural Works, was destroyed by fire, but the company rebuilt and enlarged the plant without delay, and even opened a branch factory in Listowel. Another saw mill set up in 1870 was converted to a grist mill. This was burned but was rebuilt in 1886.



ROADS IN AND NEAR CULROSS TOWNSHIP

IN PERIOD, 1856-1881

AFTER INFORMATION COMPILED FROM ROBERTSON.

Scale 1" = 4 MILES

FIG. 20

During this period of growth in Teeswater, a butter factory was established. It was the second one in Canada, and the first in Ontario, facts which indicate the importance of dairy products to the economy, even at the early date of 1878. The milk was brought in by wagons in the morning and at night. Later, cheese was manufactured as well as butter and the company bought milk from a wider radius.

During the period 1856 to 1881, there were other evidences of progress. In 1870 a Carnegie library was built, and in the same year the land for a fair grounds was purchased and made ready for the first Teeswater Agricultural Fair, which was held some years later.

The narrow gauge railway, which was built to Teeswater as terminus, brought with it better connections with Toronto. The Toronto, Grey and Bruce Company owned it at first, but later (around 1880) sold it to the Canadian Pacific Railway Company, which standardized the gauge.

On the Clinton-to-Walkerton Gravel Road, a bridge was constructed at Teeswater, where formerly a ford had supplied the only river crossing. This bridge considerably improved the connections with Walkerton and Wingham (figure 20).

Moscow was another village of Culross founded about 1856. By 1868, the village had a saw mill and grist mill, and some years later a tannery. For a number of reasons Moscow passed out of existence as an urban centre: Both of its mills were burned in 1880; Moscow was off the main roads, when they were constructed, in an area just on the eastern margin of the Greenock Swamp; and the railway that was brought into Culross, did not go beyond Teeswater.

Formosa was another settlement of Culross founded in the late 1850's, but unlike Moscow it continued to grow into a thriving village. The site chosen was the boundary of Culross and Carrick Townships at a point where the Formosa Creek had a sufficient fall to provide power for a saw mill, which, by 1860, had begun cutting timber for the settlers of the area. A grist mill was built about ten years later.

As the settlers here were mainly Germans of the Roman Catholic faith, living in a community surrounded by Protestants, they erected a log church, and about ten years later in 1872, a convent. A stone church completed a year later is still the church of the village.

In 1870, to serve the German community, a brewery was established, using barley from Culross and Carrick. By 1880, the brewery was delivering beer to an area of thirty-mile radius. By this time, too, the saw mill was serving a twenty-mile radius, and was turning out 600,000 feet of lumber and shingles yearly. The grist mill became increasingly important, when the mills at Moscow were destroyed by fire in 1880, and the mill at Formosa became the closest one for the farmers in the north-east of Culross. Other industries of Formosa at this time were a cigar factory and two cabinet shops.

Belmore, too, was founded later in the period, 1856-1881, in the 1860's at a site that became the intersection of the Culross-Carrick Road and the road connecting the Elora and Wawanosh Roads (figure 20). Here the nucleus of settlement was a saw mill built on a small stream. As the population of Culross increased, Belmore grew accordingly. A cheese and butter factory was established in 1878. By 1881 the village had a pump factory, two hotels, and a grist mill with a capacity of 200 bushels of grain a day.

IV. Period of Decline, 1881 - 1931

The population of Culross fell steadily during the years 1881 to 1931 (figure 12). Teeswater also lost population, but more gradually, declining to a minimum of 792 in 1931 (figure 21).

The main reasons for this rural depopulation were both social and economic. Introductions of new agricultural machinery at this time reduced labour needs on the farms. Moreover, lands that were less productive, because of poor drainage, stoniness, or steep slopes, were being taken out of production, and fewer farm hands were needed. Since labour moves to where it is most needed and best rewarded [1], part of the labour force which had once worked the farms in Culross moved to Western Canada, and to the United States, where new lands were being opened up for settlement, or to the cities where job opportunities were plentiful. Not only the farm labourers, but also the farmers' sons left the township seeking opportunities in the trades and professions.

This depopulation changed the landscape of Culross. Clearing of land slowed down, and some lands that had been cropped or pastured were returned to forest. Forest cover in Culross was actually in the increase after 1911. This helps to account for the decline of crop land and pasture (figure 13).

Farm sizes increased in the period 1881-1931. In 1881, there were approximately 165 farms over 100 acres; near the close of the period there were about 200 (figure 16), an increase of 21%.

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1. S.A.Cudmore, "Rural Depopulation in Southern Ontario" Transactions of the Royal Canadian Institute, No.22 Vol.9, part 3, Nov.1912.

No doubt, some farmers who had surplus capital were expanding their acreage by buying up lands of retired farmers whose sons had migrated to the cities.

One of the most noticeable changes in agriculture during this period was the decline of wheat as the major field crop (figure 14). The wheat acreage declined from a high of 4,720 acres in 1891 to 1,587 acres in 1931. In the same period oats increased from 6,169 acres to 11,832 reaching the maximum acreage for field crops. These trends were results of both the drop in the wheat market due to increased wheat production in Western Canada, and increased specialization in the East in the cattle industry. Hay acreage continued to increase as it had in the previous period 1856-1881. It reached a peak of 9,241 acres in 1931. Since mixed grains, oats with barley or rye, yielded well, they increased in acreage during the later decades of the period 1881-1931, but were less important than oats as a feed grain.

Another significant change was the marked decrease in sheep numbers (figure 15). There were 5,489 sheep in 1891 and only 1,809 in 1931. Cattle and swine were replacing sheep because of the better income from the former. Moreover, mutton was less in demand than beef or pork during this period, and the woollen industry was suffering from competition from imported woollens.

Cattle numbers increased slightly from 6,528 in 1891 to 7,132 in 1931. Although this is not a large increase, it came at a period of population decrease and at a time before any significant specialization in farming. The raising of beef cattle was the most

profitable way to utilize the cleared land; and the raising of dairy cattle was likewise profitable especially since the large local creamery provided a ready market for dairy products.

The period 1881 to 1931 was one of stagnation rather than a period of decline for Teeswater, as the population dropped to 792 in 1931 (figure 21). This decline, however, was not as rapid as that of the rural population during the same interval, for the Teeswater population was mainly comprised of businessmen, retired farmers, and a few factory workers, rather than young men who would be interested in seeking opportunities in the cities or in Western Canada. Several industries were closed: the foundry, the Teeswater Milling Company, and the woollen factory. The mill of the Teeswater Milling Company was destroyed by fire and was not rebuilt; the owners of the foundry went to Western Canada; and the woollen factory closed when competition from overseas wool became severe. Few new industries were established in Teeswater during this period. The Gypsum, Lime and Alabastine Company Ltd. started a lime quarry in 1919, but they abandoned the business in 1928 because the markets of Toronto and Hamilton were too far away to warrant the cost of producing the lime. The company opened quarries at Paris, Ontario, which were closer to their markets. The cheese and butter factory retained its prosperity; markets for dairy products remained steady.

Formosa, too, stagnated during the period 1881-1931. The brewery and saw mill remained as the most important industries, and no others were established.

Belmore declined in size and importance for several reasons: The hotels closed during this period because the roads through the village declined in importance and automobiles eliminated the need for accommodation in village hotels. The Clinton-to-Walkerton Gravel Road (figure 20) carried more north-south traffic than the Culross-Carrick Road. Moreover, the Durham Road carried more east-west traffic than the east-west road through Belmore. During the period, too, the creamery at Teeswater was expanding and pushing out smaller companies. The Belmore cheese and butter factory, with a milkshed and factory of smaller capacity, could not compete profitably, and was, therefore, forced to close. The saw mill burned in the late 1890's and was never rebuilt.

Hence the period 1881 to 1931 saw changes in some agricultural trends, intensification of others, and a decrease of both the rural and urban populations. Industrially the township stagnated. Only the Teeswater creamery and the Formosa saw mill were not greatly effected by the period of decline.

V Period of Resurgence 1931 - 1962

The resurgence of the economy has been mild in some respects, but profound in others.

In agriculture, because of the Great Depression of the 1930's and World War II, some trends begun in former periods changed: Others continued. Wheat, for example, continued its decrease in acreage until, in 1956, there were only 349 acres planted (figure 14). An exception to this trend occurred around 1940 when, because of the need for increased

food supplies during World War II, more wheat flour was needed. Hay has continued to be important. Since the farmers have continued to get better yields with mixed grains, which provide satisfactory feed for the cattle and pigs, the farmers have increased mixed grain acreage. Oats, however, as a crop by itself has declined greatly in value.

The phenomenal rise of the mixed grain acreage (figure 14) is the result of other changes that have been taking place since 1931. In this period, 1931-1962, the farmer of Culross has been judicious enough to specialize because he finds that mixed farming as it was carried on in the former period provides less lucrative returns. The trend toward specialization is of two kinds. On the large farms, 180 acres and more, the farmers raise beef cattle, or beef and dairy cattle, or dairy cattle and hogs. On the smaller ones, the farmers are specializing more in the production of different products; for example, broilers, hogs, cucumbers and turnips.

The number of cattle has increased appreciably. Although in the decade of the depression there was actually a decrease in numbers, yet from 1931 to 1956, the overall increase in the numbers of cattle has been over six thousand. At the same time, there has been a steady and remarkable rise in the number of swine (figure 15). A trade agreement with Britain in 1932 made hog marketing conditions good. Although that agreement no longer stands, the hog market remains favourable, and the numbers have increased to almost ten thousand. Sheep numbers, as in the period before, have continued to decrease, until 1951, when there was a slight increase. Because the tractor has replaced the horse on almost every farm, the number of horses has declined to about fifty.

The farm landscape has changed in this period as it had before. The trend to larger farms has continued, most farms now being from 70 to 180 acres and many of them from 180 to 400 (figure 16). Six farms in Culross contain over 400 acres and two of these have 1000 acres. This means that there are fewer farms. In the period from 1931 to 1962 there have been altogether seventy abandoned farms, some of these eventually purchased and incorporated by the purchasers to make larger farms. About 1000 acres, too, of these abandoned farms have been purchased by Bruce County or by the Saugeen Valley Conservation Authority. In a few areas of the south-west, the stone foundations and the lack of trees give the only indication of former occupance on the land.

The decrease in population has continued since the previous period for similar reasons: Increased mechanization on the farms and increased opportunity for profitable work in cities and towns. Yet, in 1951, the population of Teeswater began to increase (figure 21) as new industries were established there. A similar increase, although rather slight, was apparent in the rural areas (figure 12). Part of this is due to job opportunities for men who do part-time farming. In all, 111 Culross farmers commute to other centres for work. Another reason for the population increase may be the younger owners with larger families on the farms of Culross. Statistics show that the farms change ownership every ten years. Twenty-five percent of the population is of public school age.

The means of transportation in Culross and surrounding areas have changed in this period. The railway had been the most important means of shipping goods in the previous period, and in the first three

decades of the present one, but when Highway 4 (figure 4) and other highways in the province were paved and improved, and rail freight rates rose, the truck took over the railway's place as the major means of transport. All industries in Teeswater now use the local company or other transport companies to ship their goods to Toronto, Hamilton, Kitchener, and London, their major markets.

In Teeswater, the period 1931-1962 has been a period of the growth of prosperity caused partially by the establishment of new industries and a resurgence of some of the old established ones in the village itself. Teeswater's population growth (figure 21) is related to the upsurge in the economy of the rural areas, and, more particularly, the growth of industry in the last decade.

At the beginning of this period of resurgence, the Teeswater Creamery, which had been established in an earlier period, continued to make butter, but they expanded their activities to the preparation of poultry for the southern Ontario market. In 1956, however, because of competition to the butter market from margarine, and an increased consumer demand for milk in powdered form, the creamery began processing powdered skim milk. This is now shipped in eighty pound bags to companies in Toronto and Hamilton. Milko of Hamilton is a major buyer.

The creamery is an example of an established industry that changed its character to adjust to the changing external market conditions. The Litt Lumber Company, on the other hand, is an example of a new industry that was established because of external market conditions. In the 1940's, when the furniture factories in the

surrounding towns began to demand high quality timber in greater quantity, the Litt Company was established to meet the demand. It is electrically operated.

Other new industries that came into Teeswater during this period are the Heinz Pickle Company, which set up a grading station here because good cucumbers were grown in the district, the Paul Steffen Broom and Brush Manufacturing Company, and the Kennedy Axe Handle Company, both of which were attracted by the incentive of low taxes in Teeswater.

The two grist mills in Teeswater are important and necessary because of the growing livestock populations of the rural areas. Both the Co-Op and Little's Mill receive Western grain, mainly oats and barley, which comes into Goderich by lake freighter and from Goderich to Teeswater by truck. Corn from Chicago, now the leading feed in the two mills, comes via Goderich as well. Very little local grain is ground, though they both do some "custom work". Both mills use water power, but also have auxiliary power: Little's, a diesel, and the Co-Op, an electric engine.

Formosa and Belmore have changed little since the former period. The brewery and lumber mill at Formosa seem to have retained and improved their prosperity. Belmore has a new chopping mill built in 1935, and a transport company, established in 1955. The latter has expanded its business having a fleet of ten trucks today.

Throughout its history, Culross has remained a rural township, its people adapting their mode of life to their physical surroundings, the changing economy of the province, and the opportunities

afforded by the growing markets of the industrial cities and towns of Southern Ontario. The trend toward specialization in agriculture and consolidation of the farms has changed the landscape from a land of forest and small cleared plots to a land of large cultivated areas, pasture, and small woodlots.

CHAPTER III

PRESENT LAND USE IN CULROSS TOWNSHIP

Information on the land use in Culross Township was compiled by the author from field work, with some help from air photographs, in the summer of 1962. Observations are categorized under nine headings (map 3), an adequate number for the detail required and the scale of map used.

Non-cultivated land use in Culross is of four types: swamp, woodlots, reforested areas, and permanent pasture.

Swamp is the very large area of forest in the north-west (map 3) on the margins of the Greenock Swamp, so called because the major portion of it lies in Greenock Township (figure 2). Apart from this large area, the swamp areas are small, occurring along some streams, and in some depressions of the rugged south-west.

Woodlots occur in three main general locations: on some steep hillside slopes, mainly in the south-west on Donnybrook sandy loam and the Dumfries loam (map 2); on land too wet for agriculture; and in small woodlots on gently sloping topography and well-drained soils. The woodlots on the steep slopes are small and contain trees that have grown up on cleared land that has been abandoned. Hawthorn and shrubs are especially common. The main stands of woodlots on the land too wet for agriculture occur along the glacial spillways; the small stands are in pockets among the hills in the south-west. Others grow in the till plain on Parkhill loam, scattered through the eastern half of Culross. These are usually second-growth stands, of comparatively small trees, extending

into the woodlot from the edge for approximately two hundred feet; the trees in the centre of the bush are older and taller. This seems to indicate that the edge was cleared and cultivated, but abandoned (probably during the period 1856-1881) because poor drainage conditions made cultivation difficult and unprofitable. The woodlots on well-drained soils occur in Culross Township chiefly as strips running east-west between the concession roads at the backs of the farms. The land was cleared to this point, but farmers left their woodlots as a source of firewood and lumber.

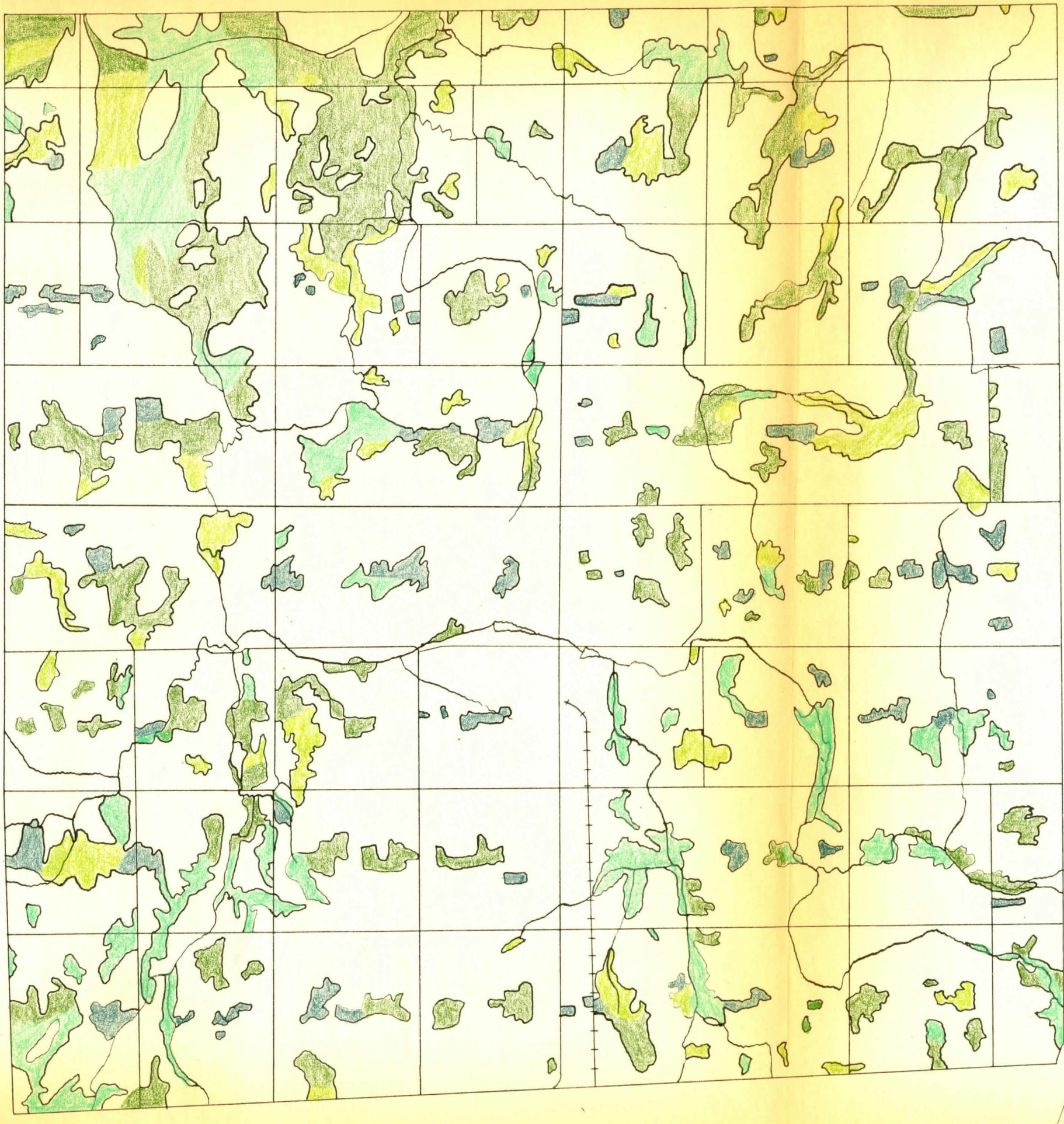
In Culross, over ninety percent of the woodlots of all locations are unfenced from livestock. Fifty percent are overgrazed as indicated by the lack of reproduction, and the compaction of the soil in the woodlots.

About 10,129 acres, that is 18% of Culross Township's total area, are forested with trees of four main Forest Type Groups: Elm Type, Sugar Maple Type, Poplar-White Birch Type, and the Cedar-Tamarack Type (figure 22).

The Elm Type, an association of hardwoods, grows on poorly drained areas in the spillways of the north-west and in the poorly drained hollows of the till plain. This type makes up the bulk of the forest land in Culross, occupying 5,754 acres. Included in the Elm Type are black ash, white elm, red maple, silver maple, and ironwood. Eleven percent of the trees are 10" to 18" in diameter and would make good saw logs. The remaining 89%, under 10" in diameter, may provide a supply of merchantable timber in the future.

CULROSS TOWNSHIP

FOREST TYPE GROUPS



legend:

- SUGAR MAPLE
- ELM
- POPLAR-WHITE BIRCH
- CEDAR-TAMARACK

scale: 1" = 1 mile

N

The Sugar Maple Type is usually located on upland sites on the till plain on the land at the backs of farms. In Culross there are 2,905 acres of this type. Trees of this type are the sugar maple, beech, yellow birch, black cherry, basswood, and some oak and hickory. Thirty percent of the trees are from 10" to 18" in diameter, large enough to be a source of saw logs; sixty-two percent, 4" to 10" in diameter, and the remaining 8%, the young trees under 4" in diameter, are the growing stock for future saw timber.

The Poplar-White Birch Type includes the aspen, white birch, willow and pin cherry. The willow and white birch grow on imperfectly or poorly drained areas, and the aspen and pin cherry, on the higher ground. Most of the trees are under 4" in diameter having recently grown up after the cutting of patches of woodlots of either the Elm or Sugar Maple Types. None of the trees of the Poplar-White Birch Type constitutes a source of law logs for Culross.

The Cedar-Tamarack Type, growing mainly in the spillways (figure 22, map 1), includes the two softwoods, white cedar and tamarack. The total area covered with this type of forest is 869 acres. The trees in 45% of the acreage are under 10" in diameter, and the smaller ones supply local needs for fence posts. Rail fences, a common sight in some parts of Culross, are giving way to wire fences supported by cedar posts.

Appendix IV gives further figures on woodlot conditions in Culross, and compares these statistics with those for three other townships in the Lower Saugeen watershed: Bruce, Greenock, Saugeen.

Reforestation can make waste land, where little or nothing is now grown productive. It is especially important in providing adequate protection for the soil and for retarding run-off of water from melting snow and rain. In Culross most of the reforestation has been done in the south-west corner where some of the steeply rolling lands have been planted in white pine and spruce by Bruce County and the Saugeen Valley Conservation Authority. Much, however, remains to be done on marginal land here in this area and in other parts of the township, particularly in the north-west where certain areas have been unwisely cleared and not reforested.

The fourth type of land use of uncultivated land is permanent pasture. Most of the permanent pasture occurs on steeply sloping areas of Dumfries loam and Donnybrook sandy loam, and on poorly drained areas of Parkhill loam and Muck, land that was originally cleared for agriculture but that is now considered unsuitable for cultivation. The principal area of permanent pasture forms roughly a semi-circle on these soils extending from the south-west to the south-east, and passing north of Teeswater. In the south-west part of this semi-circular area many stony or gravelly knobs of the kame moraine are permanent pasture. Not all permanent pasture in Culross Township is on poor land: Some occurs on Harriston loam and Teeswater silt loam on farms where the economy is based on livestock. The farmers rotate feed grain, hay, and rotation pasture and retain the rest of their farm acreage as permanent pasture. On some farms this is a large acreage; on others it is only one or two small fields.

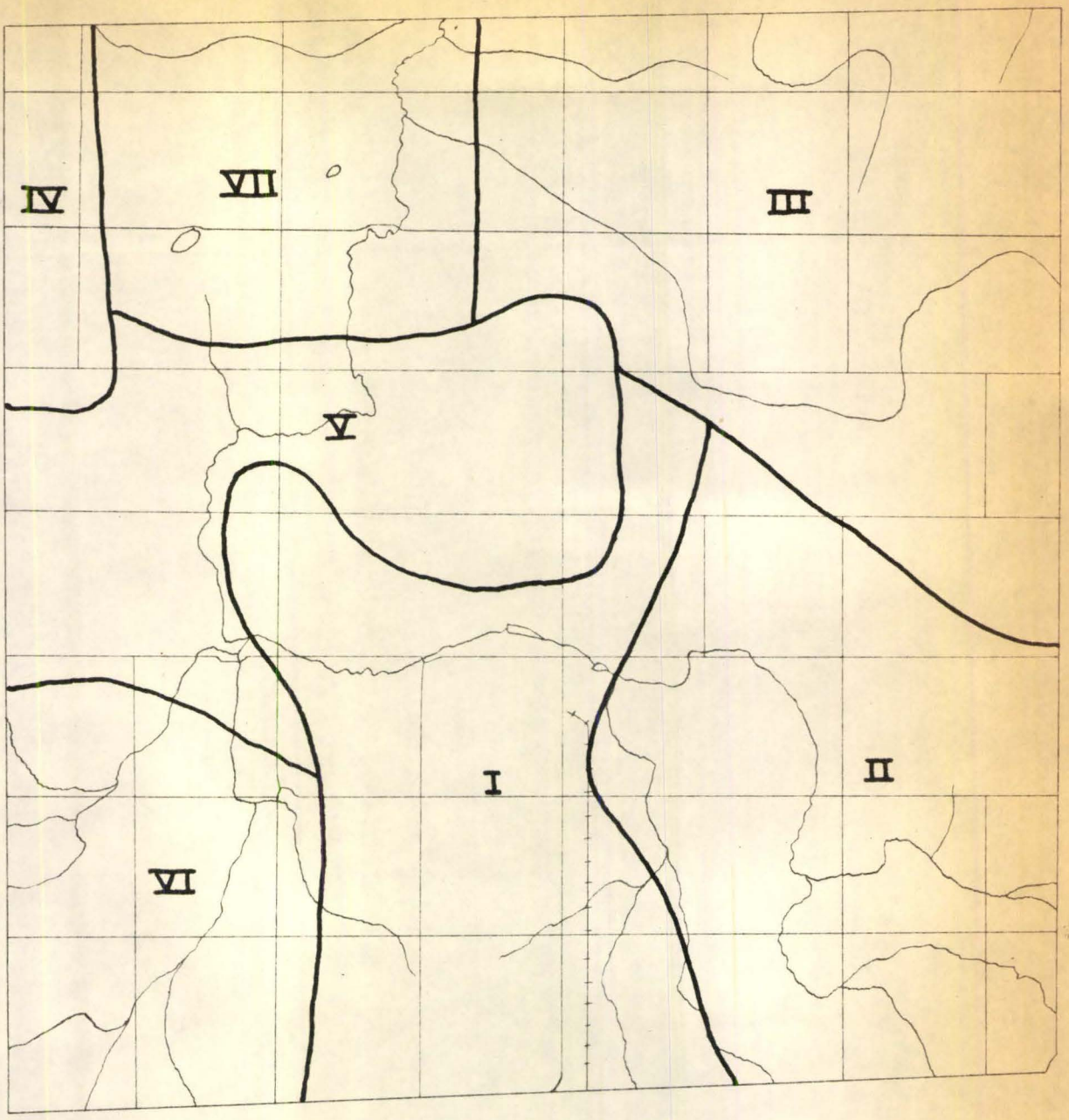
In Culross, the cultivated land is used for the growing of hay and rotation pasture, small grains, corn, and row crops.

The main cultivated land use is hay and rotation pasture, occurring on all soil types, but with a marked concentration on Teeswater silt loam and Harriston loam. Farmers who raise large herds of beef or dairy cattle need extensive pasture land and large amounts of hay for fodder.

Fields of small grains, too, are scattered throughout the township on most soils, but they occur primarily on Harriston loam. In 1962, the small grains in Culross were mixed grains, oats, barley, and wheat. Oats and wheat have been less important than mixed grains in the last few decades, with respect to acreages (figure 14). The keen competition of Western Canada's wheat, and the low income which would result to the Culross farmer if he grew wheat for flour exclusively have helped to keep the wheat acreage low. Oats, used as a feed grain for livestock, particularly for horses, has been surpassed in acreage by mixed grains (oats, barley, and some wheat sown together, or oats, rye, and barley sown together). Mixed grains have the advantage of giving higher yields for the same acreage, and of being less bulky than oats because of less crude fibre. Moreover, mixed grains have a high nutritional value. The decline of the number of horses in Culross, too, is a reason for a decreased need for oats.

Fields of corn are scattered over the whole township, but grow predominantly on Harriston loam, on Teeswater silt loam, and on Donnybrook sandy loam, where there are areas of till. This crop is limited in Culross by the relatively short growing season and the cool summer temperatures. All corn grown in Culross is used as silage for

CULROSS TOWNSHIP



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REGIONS

SCALE: 1" = 1 1/2 MI.

FIG. 24

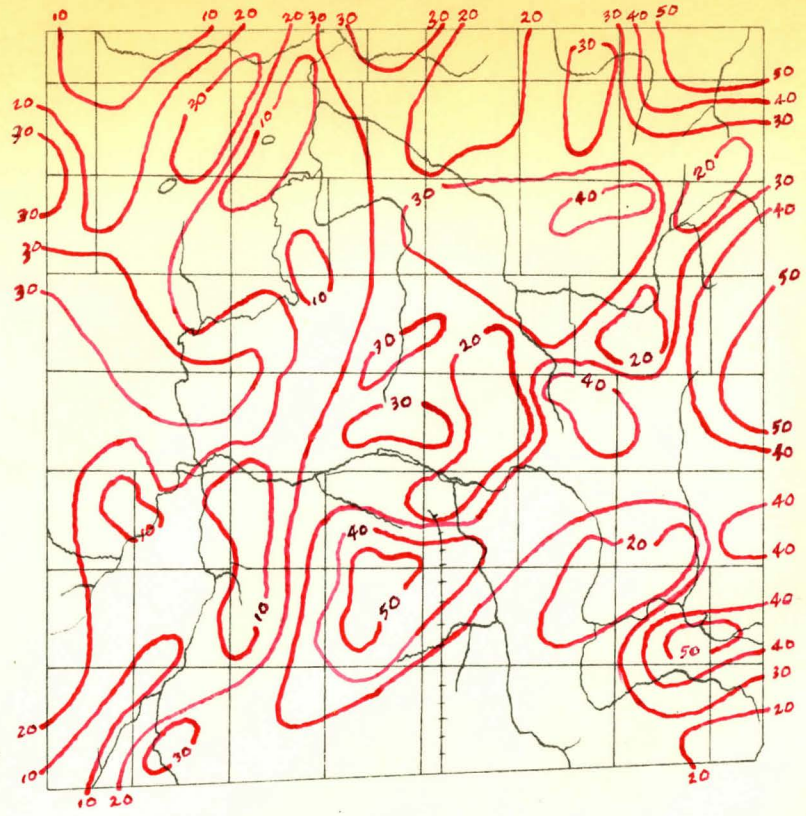
swine and cattle.

Row crops in Culross are grown mainly on Harriston loam, which is more heavy-textured than other soils in the Township. Turnips, cucumbers, potatoes, and beans are the main row crops. Their acreages are small and difficult to map on the scale of map 3. Hence, many small plots (one or two acres) of cucumbers, potatoes, beans, etc. have gone unmapped. The fields mapped as row crops (map 3) are mainly turnips and cucumbers. There were, however, only six such fields in 1962. This indicates that Culross is not a major market gardening area; city markets are too far away. Turnips and cucumbers are grown because they grow well in cool temperatures, and because they keep fresh and can be shipped easily from the township. Turnips are waxed in Walkerton, so that they can be shipped without spoiling; cucumbers come to the Heinz grading station in Teeswater from which they are shipped for the pickling process.

In an attempt to show any geographical relationships of the physical and human characteristics of Culross Township, the author has divided the township into seven regions (figure 24) using figure 23 (prepared with map 3 as a basis), the soil map (map 2), and the physiographic map (map 1) as guides. A discussion of the geography of each region is important and necessary for a clear understanding of the whole economy of Culross.

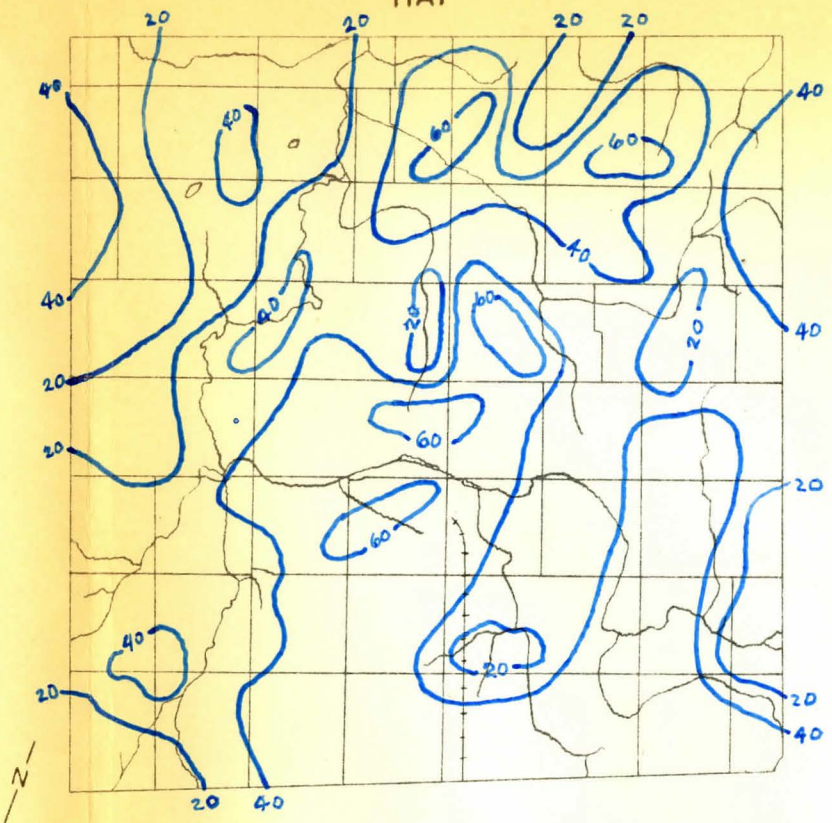
Region I is an area of till plain, drumlins, and spillways. Fortunately the alignment of the several drumlins is generally north-south, in the same direction as the lots. This alignment makes it convenient to plow and cultivate the slopes on the contour. Fertile soils such as Harriston loam, Listowel loam, and Teeswater silt loam predominate in Region I. Over 40% of the land in this region is in hay and rotation pasture, with concentrations west and north of Teeswater,

FIELD CROPS



ISOPLETH INTERVAL 10%

HAY



ISOPLETH INTERVAL 20%

CULROSS TOWNSHIP

ISOPLETH MAPS

LEGEND:

-30- FIELD CROPS (INCLUDES SMALL GRAINS, CORN, ROW CROPS)

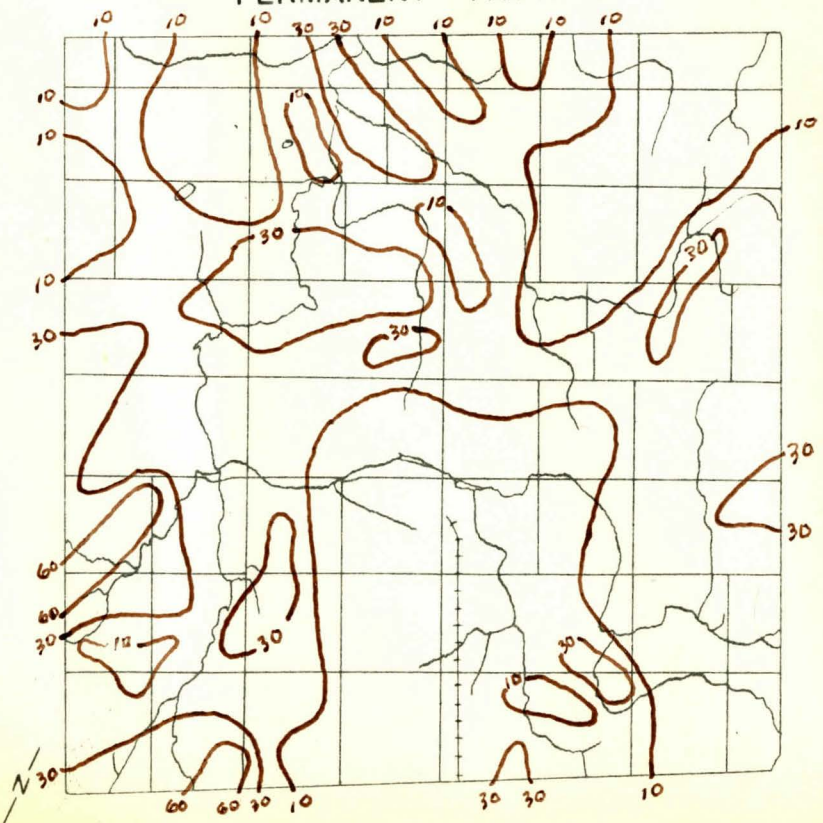
-20- HAY (INCLUDES ROTATION PASTURE)

-30- PERMANENT PASTURE

-10- WOODLOT (INCLUDES SWAMP)

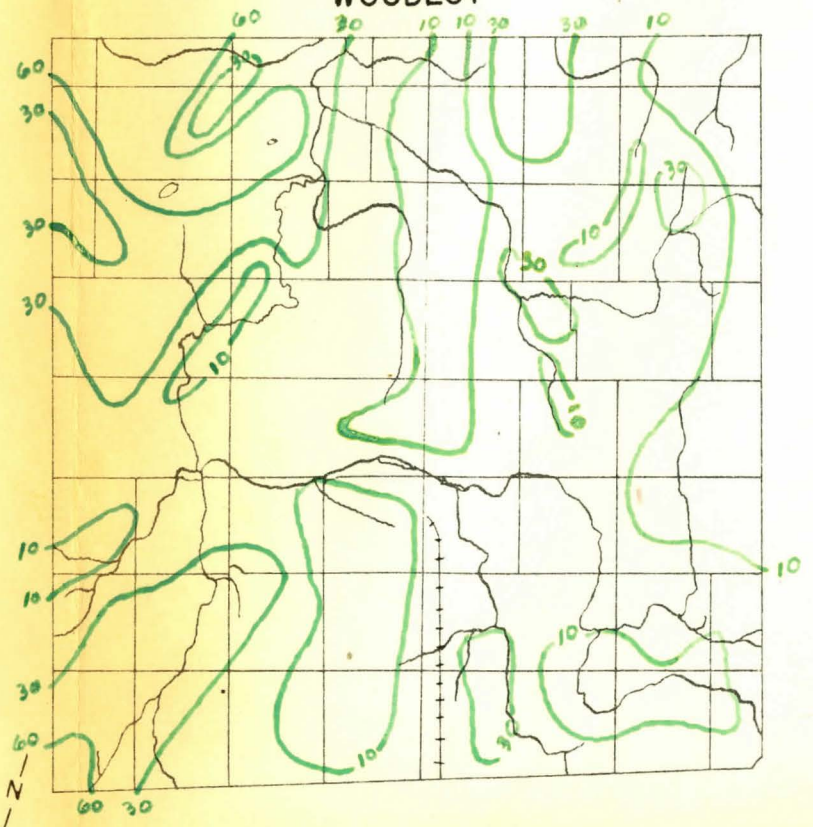
SCALE: 1" = 3 1/2 MILES

PERMANENT PASTURE



ISOPLETH INTERVAL 30%

WOODLOT



ISOPLETH INTERVAL 30%

where the percentage rises to sixty (figure 23). This large percentage is not related to unfavourable soil or climate conditions for grain growing (both Harriston loam and Teeswater silt loam are capable of producing fifty to sixty bushels of mixed grain per acre), but rather to the fact that most farmers here have begun to specialize in beef and dairy cattle. The farmers who have 60% of their land in hay and rotation pasture have the beef cattle. Their herds of Herefords or Shorthorns average around two hundred head; they are mainly feeder cattle, brought in from Western Canada by train as heifers, and fattened in Culross for shipment by truck to Toronto, Hamilton and Kitchener.

South of Teeswater there is a different concentration. Fifty percent of the land is in field crops (figure 23) with small grains predominating (map 3). The farmers here are specializing in dairy cattle almost exclusively. Dairy specialization demands more feed grain and less pasture than beef cattle specialization does. Holsteins are the main breed but high quality Jerseys are also common. Large herds in this region number about forty cows and heifers over two years of age, and about the same number under two years of age. The farmers market their milk at the creamery in Teeswater.

Most of the farms of four hundred acres or more that occur in Culross are found in Region I, especially along Highway 4, Concession IV and Concession VI. Two of these farms are of one thousand acres each.

Another characteristic of Region I is the relative absence of woodlot and permanent pasture. Those woodlots which remain are

fine hardwood stands preserved at the backs of farms for whatever need they can supply. Permanent pasture, where it does exist in Region I, supplements the rotational pasture, and is usually fertilized and improved.

Region II, located east of Region I, is also an area of till plain and spillways. A few drumlins occur, but again, their alignment, almost north-south, is an advantage rather than a disadvantage. There is in Region II, however, a portion of kame moraine with its characteristic steeply rolling topography. The soils of Region II are generally fertile (Harriston loam and Teeswater silt loam), but there are less fertile areas of Donnybrook sandy loam and muck in the kame moraine.

The landscape pattern is somewhat different from that of Region I. Field crops and hay and rotation pasture each occupy the same percentage of the land (about 30% or 40%), but there is one area north of Belmore where there is a 50% concentration in field crops (figure 23). In Region II the livestock specialization differs from that of Region I. Instead of having large herds of one type of livestock, the farmers here have smaller herds of livestock in combination: beef and dairy cattle, or dairy cattle and hogs. In the area north of Belmore the larger amounts of field crops produced are needed as fodder for the dairy cattle and hogs. A reason for the change in specialization is the physical nature of Region II. Moderately rolling to steeply rolling land in some areas grows pasture for beef and dairy cattle but limits the size of the herds: dairy herds of 18 to 20 cows and heifers over two years of age, as many young cattle, and about 100 pigs; or the dairy herds of 18 to 30 along with 50 to 75 beef cattle.

Much of the woodlot in Region II is also at the back of the farms. On the other hand, however, a large acreage follows streams and depressional areas, and some farms have 30% of the land in woodlot. Permanent pasture occupies land that is marginal, but that had been cleared, and some of the wet flood plain areas along the streams. The amount of the land in permanent pasture in Region II varies from 30% to 10%.

In Region III, as in the former regions, the till plain and spillways dominate the physiography. Fertile soils occur here, but there is a larger acreage of poorly drained soil than in either of the other two regions. Harriston loam and Teeswater silt loam predominate with strips of muck in the depressions of the spillways.

There are concentrations of both hay and rotational pasture, and field crops. West from Formosa are two areas where 60% or more of the land is in hay and rotation pasture. The raising of beef cattle, as in Region I is the specialty here, but the farms are smaller, averaging 100 to 200 acres. A large herd has approximately 75 to 100 head of Herefors or Shorthorns. Some Dual Purpose Shorthorns for milk and beef are raised, but their numbers are few in Culross. North and south of Formosa along the eastern margin of the township there are concentrations of field crops. In general, 40% of the land along this eastern margin is planted in field crops. In the south-east and north-east corners of the region, 50% and more is devoted to the cultivation of field crops, especially corn and barley. Corn is used as feed for hogs, that are raised here in combination with dairy cattle or poultry; the barley is marketed at the brewery in nearby Formosa.

Because of the relatively large areas of poor drainage, there are some areas in Region III where more than 30% of the land is in forest. Permanent Pasture is usually found adjacent to the woodlots.

The reader will note that the first three regions contain the three villages of Culross Township. The remaining four regions contain no urban settlements.

Region IV is mainly one of till plain and drumlins and the soil, predominantly Harriston loam, is fertile in most areas. This region has been, and to some extent still is, isolated from the three regions previously discussed by a large swampy area. Twenty percent of the land in all of Region IV, and 40% along the western margin is in hay and rotation pasture. Field crops occupy from 20% to 30% of the land (figure 23). On farms of 50 to 100 acres, the farmers here raise broilers, hogs, and cucumbers. Beef cattle are not raised on these smaller farms in significant numbers.

Woodlots follow the poorly drained areas exclusively and there has been some reforestation in the north of the region. Permanent pasture borders the woodlots, except where these areas have been reforested.

Region V is an area of kame moraine which has been cut by a spillway. A small area of till plain occurs in the eastern margin of Region V. Although the soil is relatively poor Donnybrook sandy loam in most of the region, some areas of fertile Harriston loam occur on the till plain. In this region no one land use dominates: Approximately 30% of the land is in permanent pasture, 30% in hay and rotation pasture, 30% in field crops, and 10% in woodlot. Beef cattle raising is the specialty along the eastern margin of the region, on the till

plain, where about 40% of the land is in hay and rotation pasture. Several large farms here specialize in dairy herds. In most of the region however, hogs, poultry and some dairy cattle are raised. The farms are generally 50 to 100 acres, and only along the transition area between Region V and Region I in the eastern margin are the farms somewhat larger (some up to 300 acres).

The woodlots grow on some steep slopes and in most depressional areas in Region V. Areas of unused permanent pasture of the region should be reforested.

Region VI, an area of infertile Donnybrook sandy loam and Dumfries loam in the kame moraine area, has most of the land in forest and permanent pasture. There is only one area where 40% of the land is in hay and rotational pasture, the eastern margin of the region, which is a transition area between Regions VI and I. Here the raising of beef cattle is important. In other areas of Region VI, mixed farming and the raising of hogs and poultry are carried on.

The work of reforestation has been begun in the southwestern part of the region by Bruce County and the Saugeen Valley Conservation Authority.

The last region, Region VII, is an area of depressional spillway and kame moraine, with poor soils and uncultivable land. Consequently agriculture is less specialized here than in any of the regions. The predominant land use is swamp woodlot. Hay and rotation pasture and field crops are grown on higher ground. The marginal higher ground is permanent pasture. Mixed farming is the rule and generally hogs are raised as the most important livestock. Small flocks of sheep graze the permanent pasture. The farms, some of less

than 10 acres, others from 10 to 50 acres, appear isolated, even though the road connections with Teeswater and Formosa are good. Since the high ground has been cleared, the spillway contains all the woodlot.

These seven regions have been described to show that there are noticeable differences within the political unit known as Culross Township. The people themselves are probably unaware of any existing formal geographic divisions, but they realize that all parts of the township do not offer equal farming opportunities.

Gravel pits are the main industrial land use in Culross. They are scattered through the township, invariably in connection with the kame and spillway deposits. Since none of these gravel pits are very large, they are used only for local road maintenance.

There is no recreational land mapped. The ski "resort" west of Teeswater on Concession IV is on land that is used as permanent pasture during the spring and summer months. The ski tow is in a state of disrepair, the hills are small, and the runs are short. Only the snow cover is excellent. The area therefore, offers little or no appeal for the weekend skiers from Toronto and Hamilton.

Photo 22. Trees of the Elm Forest Type Group. The Teeswater River is in the foreground.

Photo 23. An excellent stand of trees of the Sugar Maple Type.

Photo 24. A reforestation plot in the north-west of Culross. The area was formerly permanent pasture.

Photo 25. Permanent pasture surrounded by a rail fence.

Photo 26. The three main agricultural land uses of Culross Township: small grain (stubble), corn, and hay and rotation pasture (in the background).

Photo 27. A field of turnips, one of the major row crops of Culross.

Photo 28. Herefords (beef cattle) grazing on rotation pasture on a farm in Region I. This is part of one of the two 1000 acre farms in this region.

Photo 29. Part of a herd of Holsteins, the main dairy cattle of Region I.

Photo 30. A herd of high-quality Jersey cattle on a large dairy farm located south of Teeswater on Highway 4.

Photo 31. The house and barn of a large beef cattle farm on Highway 4. Note the few scrawny apple trees. These unkept orchards are a common sight in Culross.

Photo 32. A herd of mixed breeds of beef cattle grazing on rotation pasture on a farm in Region II. The herd is somewhat fewer in number than the one of Photo 28.

Photo 33. Hogs on a farm in Region II. Wire fences and cedar poles like the ones seen here are replacing rail fences in the township.

Photo 34. A small herd of Guernsey dairy cattle on a farm in Region III. This breed is not common in Culross.

Photo 35. A relatively large farm raising beef cattle in Region V. This farm is located on the eastern margin of the region in an area of transition to Region I.

Photo 36. A small farm in Region VII. Sheep are grazing on permanent pasture. The land slopes, to the left of the photograph, into the swamp. The rail fences surrounding the fields are being slowly replaced by wire fences (foreground)

Photo 37. A log cabin on a very small farm (less than 10 acres) carved out of a corner of the swamp in Region VII. The only farming activity seemed to be the cultivation of a field of hay and of a small garden plot.

Photo 38. Permanent pasture in Region VI. The land is overgrown with hawthorns and needs reforesting badly.

Photo 39. One of the several gravel pits in Culross Township. This one, located on spillway deposits, serves local needs.

Photo 40. The broken ski tow gives evidence that the ski hills are no longer utilized..No tow rope is present and the pulley is twisted and broken.

Photo 41. The drainage tiles from this brick and tile plant are sold to Culross farmers. The plant is located west of Belmore.

CHAPTER IV

URBAN GEOGRAPHY OF CULROSS TOWNSHIP

Culross is a rural township, having only one urban centre, Teeswater, entirely within its bounds. Two small villages, Formosa and Belmore are on its north-eastern and south-eastern edge, partly within other townships.

Centrally located in Culross is its largest urban centre, Teeswater, a village whose population was 919 in 1961. The major part of the village is built on a relatively level ground surface. The Teeswater River runs in a glacial spillway which is narrow at the point where Highway 4 crosses the river. The valley widens down river. When a grist mill and a saw mill were built in the 1850's, Teeswater grew rapidly. Since there were relatively steep sides on both the north and south sides of the valley, the business section grew up on the same side of the river as the mills, farther south on the level area beyond the banks. When the railroad was built with Teeswater as its northern terminus, the central business district migrated south towards it.

The central business district contains a number of stores (hardware, grocery, variety, shoe store, furniture, dry goods etc.) a new post office, a library, a fire hall, a dairy, service stations, and a town hall. There is also a hotel, a newspaper office, a funeral parlour, and a community swimming pool. For a village of its size it has a modern and attractive main street. No stores have been abandoned.

VILLAGE OF TEESWATER

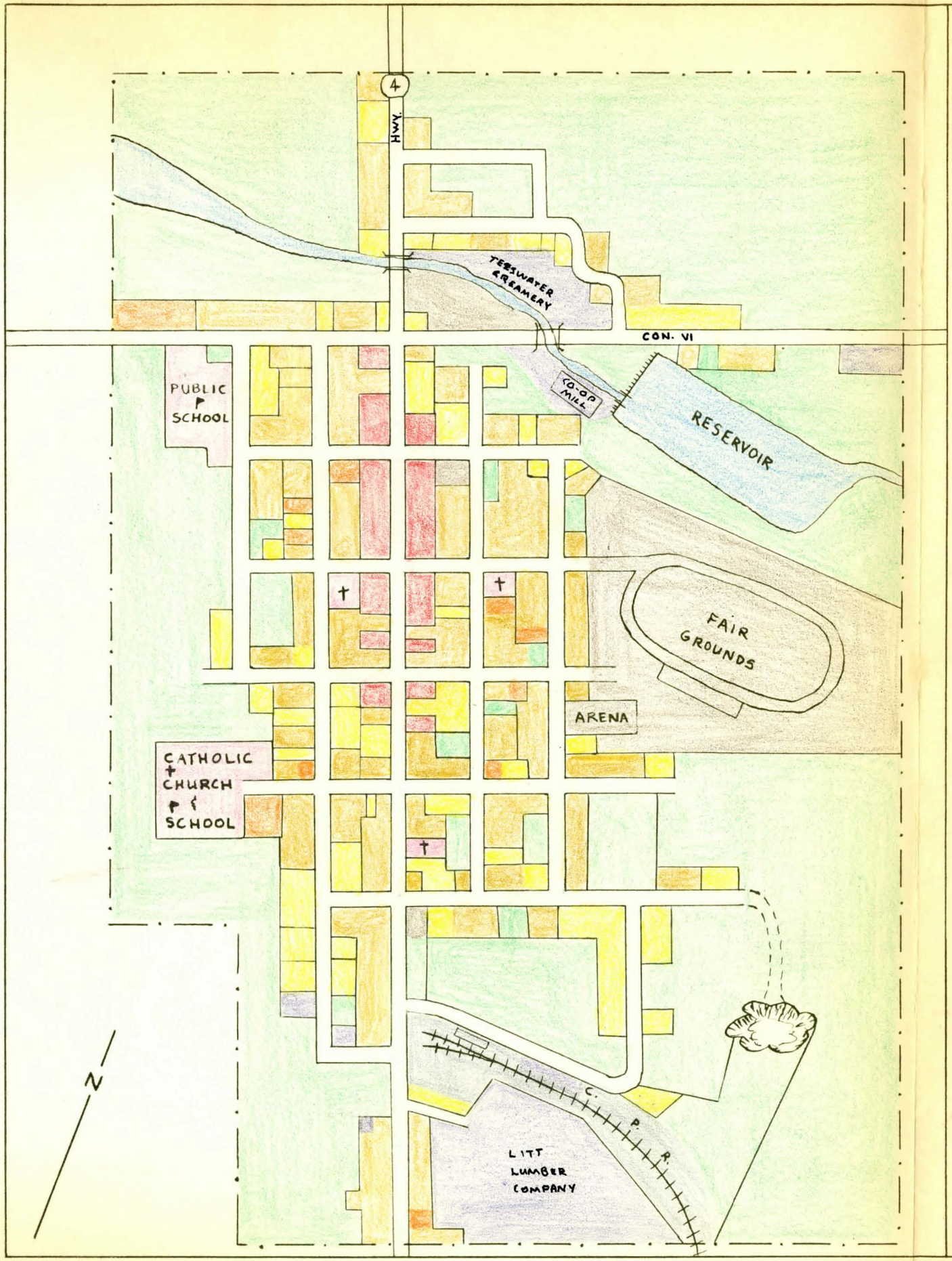
LAND USE

1962

LEGEND

- CENTRAL BUSINESS DISTRICT
- GOOD HOUSING
- FAIR HOUSING
- POOR HOUSING
- INDUSTRY
- PUBLIC LAND
- IDLE & AGRICULTURAL LAND
- QUARRY
- ROADS
- RAILWAY
- RIVER
- VILLAGE BOUNDARY
- SCHOOLS & CHURCHES

SCALE: 1 inch = 600 feet



Teeswater's merchants serve the farmers in Culross and, to some extent, in the neighbouring townships (figure 26). On the other hand, trade areas of the towns of Wingham and Walkerton, and of Mildmay village extend into Culross Township (figure 26). People of Culross go to either Wingham or Walkerton on Saturdays to shop in the supermarkets or to see a moving-picture, for Teeswater has no theatre.

The railroad and the Teeswater River have been the major attractions for industry in Teeswater, but some new industries which came in after the railway declined in importance have located along Highway 4 and Concession VI. The Teeswater Creamery Limited, located on the north side of the river, employs sixty-six to eighty men and has a fleet of 45 trucks, which pick up milk in cans or milk from bulk coolers from dairy farms of Culross and 60 to 70 miles beyond. Three farms in Culross (all in Region I), and six in nearby townships, have installed bulk coolers, which are becoming more important. For example, in May, 1962, there were 29,896 pounds of milk picked up from bulk coolers, but in July, 1962, over 60,000 pounds were picked up. This shows the increasing importance of the bulk milk coolers in the dairy industry in Culross. Butter manufacture, and poultry packaging, formerly the most important activities of the creamery, have become less important than the manufacture of powdered milk. At present the company has the largest jet-type dryer (for powdering milk) of its kind in Ontario. Poultry packaging has been completely given up, but the creamery still manufacturers an average of 14,000 pounds of butter yearly, three-fifths of this output in the summer. The federal government stores some 5,000,000 pounds of butter in one of the creamery's cold storages.

The Litt Lumber Company, located south of the railway tracks, employs ten men and cuts approximately 10,000 board feet of sugar maple, beech, cherry and ash lumber per day. The trees are obtained by contract from farmers for a radius of about fifty miles, and the rough timber, which is cut, is shipped chiefly by truck, but some by rail, to local furniture factories at Wingham, Hanover and Clinton. The Paul Steffen Broom and Brush Manufacturing Company, located on Concession VI on the eastern village limits, utilizes rock elm, maple, beech, and birch trees, mainly from Culross, for broom handles. Broom corn used comes from Argentina, Italy, and the United States, and bristles from Africa, India, and Mexico. The company serves the local and Ontario market exclusively. The Kennedy Axe-handle Company, on Highway 4 across from the railway tracks, uses rock elm and ash and sells the finished product to hardware stores within an eighty mile radius.

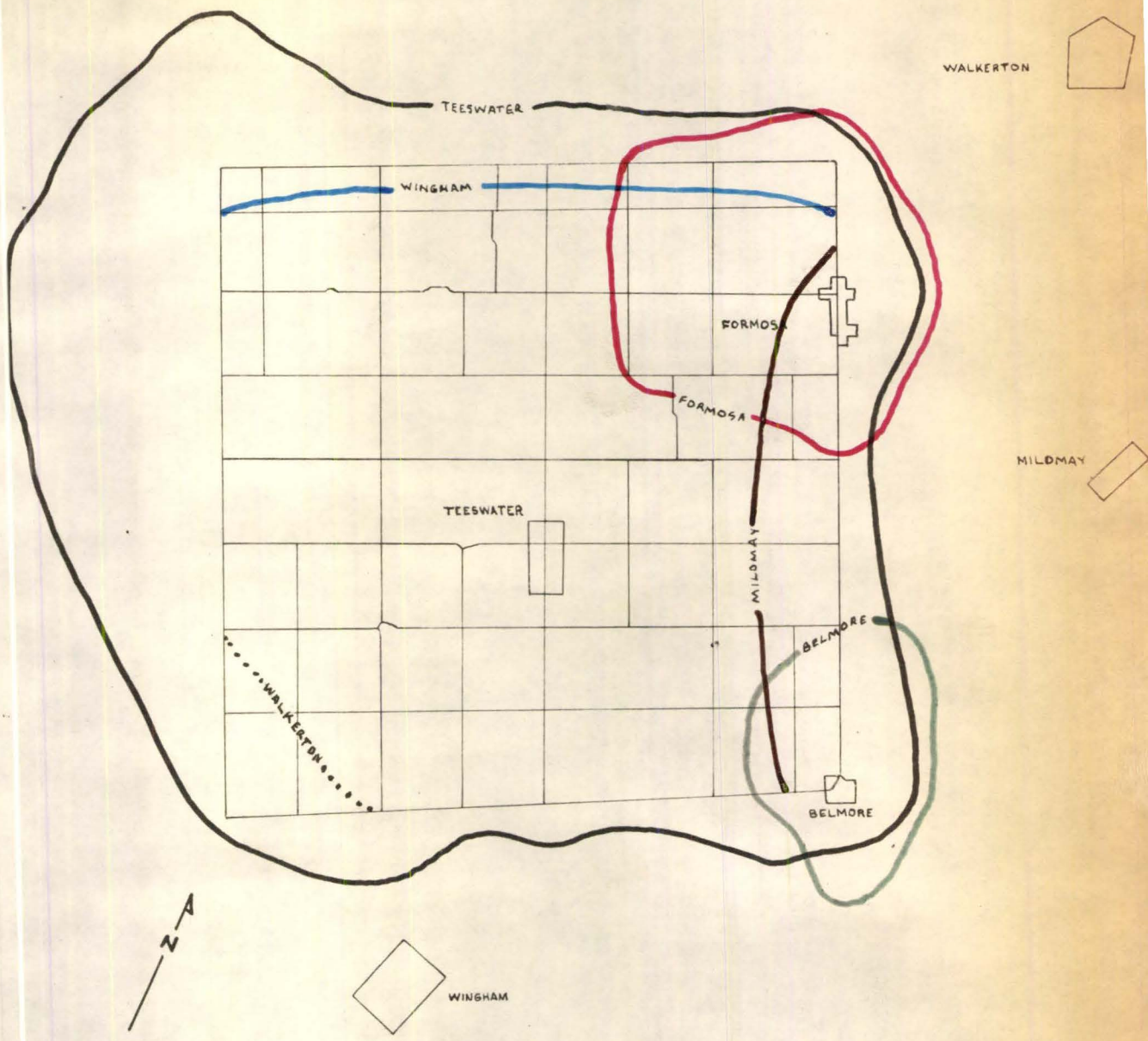
The good houses in Culross are the new houses, built in the last five years because new houses were needed. The existing ones were selling at a greater price than their age would warrant. Most of the houses in Teeswater are classed as fair (figure 25). Some classed as fair are well constructed of brick or stone, but they are not classed as good because they are old. The houses classed as poor are usually old houses, inferior in size and construction. The location of the poor housing follows no clear pattern. Generally, houses on the periphery of the village, and some of those very close to the railway tracks are poor (figure 25). The author realizes that Teeswater was a railway terminus, not a point on a through line. Since

the railway tracks did not actually go through the town, noise and smoke nuisance were never detrimental factors for the residential development.

The Teeswater fair is a very important event each fall, attracting thousands of visitors. The fair grounds cover a large area, and provide excellent accommodation for the exhibitors and visitors. On the average eleven or twelve thousand visit the fair each fall. The record attendance for the fair, 16,000 visitors, was achieved in 1943.

The Saugeen Valley Conservation Authority, in co-operation with the local Lion's Club, built a swimming pool utilizing water from the flowing well. The pool serves not only Teeswater, but also Culross Township and neighbouring towns and villages to the south of the township. A park surrounding the pool was built by the Saugeen Authority and is being improved by Teeswater for use by all the people in the Township.

The village has four churches, a United, a Roman Catholic, a Presbyterian and a Pentecostal. The public and continuation schools were located in the same building until 1953. Since 1953 the Teeswater secondary school students have all been transported by bus to Wingham and District High School. The attendance of the public school has increased slightly in the last decade because some of the Culross rural schools of low attendance have been closed and students are transported by bus to the public school. The separate school in Teeswater has two rooms.



TRADE AREAS OF VILLAGES AND TOWNS

IN AND NEAR CULROSS TOWNSHIP

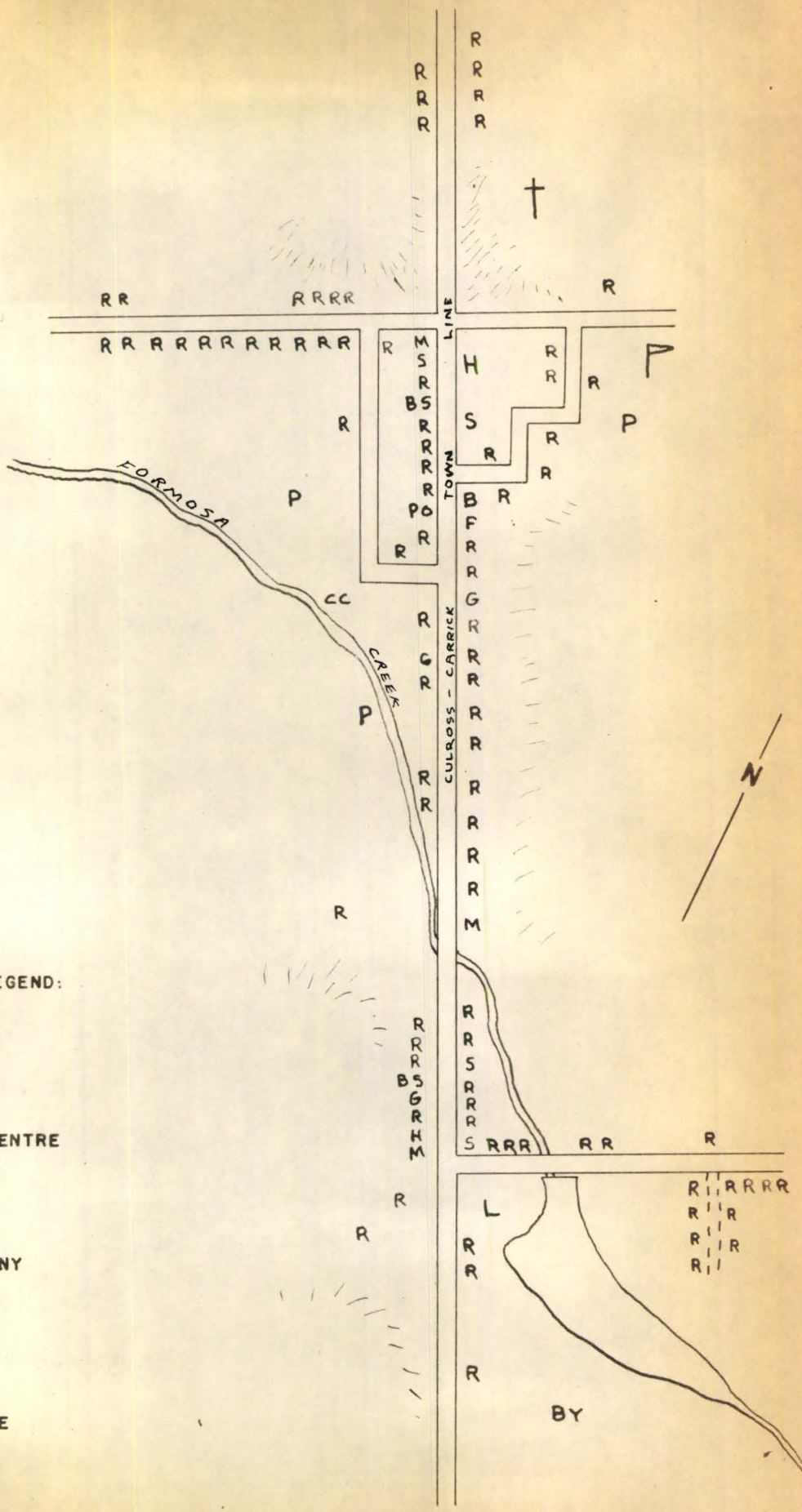
FIG. 26

SCALE 1" = 3½ miles

The village of Formosa on the eastern margin of Culross Township has developed in two sections (figure 27). Since the village is located in a spillway with steep sides, all roads leading out of the village except one, must climb steep hills. The road running east in the southern section of the village (figure 27) follows the river for about two miles to the Elora Road, and, unlike the others, has no steep grade. This road was built with capital provided by the owner of the saw mill in the 1870's, to bring in the logs and ship the sawn lumber more easily. The brewery was established in this southern section because of the good connections with the Elora Road. On a high hill to the north, the Roman Catholic Church, the centre of the religious life of this entirely Roman Catholic community, was built. Since the church and the industries were at opposite extremities of the village, Formosa developed as two small urban centres rather than one. Another key to the explanation of the dual development is the limestone outcrops on one side of the Culross-Carrick Town line, and on the other side the Formosa Creek, which flows through the village excluding side streets from the centre area between the two sections (figure 27). Some recently-built houses in this middle section serve to join the two sections, but only partially, for a park and a farm still separate them.

In the section of Formosa to the north, in addition to the church, are a school, a convent, a post office, a bank, a general store, a fire hall, and a hotel. In this northern section are most of the residences, but the houses are scattered and there are some vacant lots.

FUNCTIONAL MAP OF FORMOSA



LEGEND:

B - BANK
BS - BLACKSMITH
BY - BREWERY
CC - COMMUNITY CENTRE
F - FIRE HALL
G - GAS STATION
H - HOTEL
L - LUMBER COMPANY
M - FEED STORE
P - PARK
PO - POST OFFICE
R - RESIDENCE
S - GENERAL STORE
† - CHURCH
⚐ - SCHOOL

SCALE: 1" = 600'

FIG. 2

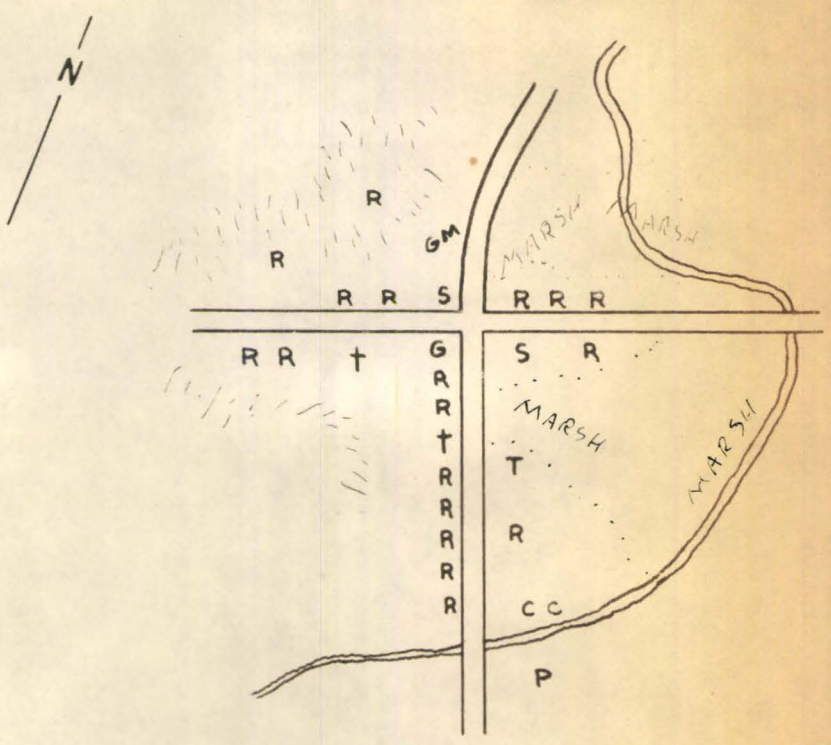
The two industries of Formosa are located in the southern section. The brewery is the better known, but its products do not travel as far as those of the saw mill. The Formosa Spring Brewery Company relies on local barley, but imports hops from California. Three trucks carry the 3,600 bottles produced daily to over 100 retail stores in Southern Ontario. Thirty-five men have steady employment. The lumber mill, owned and operated by the Weiller Brothers, uses only sugar maple, obtained from the locality around Formosa for a radius of 60 miles. One million board feet are produced yearly, 90% of which is shipped to steel mills in England and the United States. The Formosa mill is the only one in Ontario which cuts nothing but dimension stock (lumber which is sawn from a particular species for a particular purpose) for these steel mills. The company employs 20 to 30 men.

The southern section of the village has a general store, a hotel, and a few houses (figure 27).

The author was able to establish a trade area for Formosa by interviewing general store merchants and a bank teller. The brewery and the saw mill, as mentioned, have markets beyond the local area. The trade area (figure 26) is limited in Culross by the trade area of Teeswater. In Carrick Township, the village of Mildmay encroaches upon Formosa's trade. Most of the 450 people in Formosa shop in Walkerton, Wingham, Teeswater or Mildmay for items they cannot get locally.

Belmore, the smallest village in Culross, developed at the cross-roads of two formerly important roads. It is located in four townships: Culross, Carrick, Turnberry, Howick, and two counties:

FUNCTIONAL MAP OF BELMORE



CC - COMMUNITY CENTRE
G - GAS STATION
GM - GRIST MILL
P - PARK
R - RESIDENCE
S - GENERAL STORE
T - TRANSPORT COMPANY
† - CHURCH
~~ - STREAM
/\/\/ - HILLS

SCALE: 1" = 600'

Bruce, Huron. A saw mill, located on the river in the 1880's near the east-west roads, never drew settlement near it because of marsh areas along the river (figure 28). The slopes of a drumlin have kept people from building houses north-west of the cross-roads. The houses are mainly located along the left side of the north-south road, south of the cross-roads (figure 28), the largest area of dry, level land in the village. Until recently, the right side of the road was marsh, but a transport company put in some fill and built a warehouse there.

The village has two general stores, a service station, a chopping mill, a transport company, and a community centre. The population is approximately sixty.

Belmore's trade area (figure 26) extends into Culross to some degree because the farmers in the Belmore area usually come to the chopping mill here rather than to Teeswater's mills which are farther away. The general stores service a radius of only one or two miles, because most of the farmers shop in the larger grocery and hardware stores in Wingham, Teeswater or Walkerton.

Photo 42. Looking north along Teeswater's main street. Most stores have modern fronts.

Photo 43. Also looking north along Teeswater's main street. Highway 4 slopes to the river, and the road can be seen climbing the far bank.

Photo 44. A good house in Teeswater, built within the last five years.

Photo 45. Two fair houses in Teeswater.

Photo 46. A poor house in Teeswater.

Photo 47. Eleven of the forty-five trucks of the Teeswater Creamery Limited.

Photo 48. Unloading milk cans at the Teeswater Creamery. The Teeswater River is in the foreground and the valley sides are in the background.

Photo 49. Maple and beech logs,soon to be sawn, at the Litt Lumber Company.

Photo 50. The Teeswater Co-Op, one of the two chopping mills in Teeswater. This mill is in the village itself.

Photo 51. Molasses is added to most feed mixtures as a sweetener.

Photo 52. Little's Chopping Mill, about one-half mile west of Teeswater on Concession VI.

Photo 53. The dam on the Teeswater River at Little's Mill. The mill uses water power almost exclusively, relying only on auxiliary diesel power when necessary.

Photo 54. The Canadian Pacific Railway station at Teeswater. Only one freight train a day is scheduled.

Photo 55. The local transport company picking up a load of hogs.

Photo 56. Part of the parking lot in the fair grounds. The day was rainy, yet the attendance remained high.

Photo 57. The Community swimming pool. The Teeswater Creamery is in the background.

Photo 58. Knox Presbyterian Church, one of four churches in Teeswater.

Photo 59. Teeswater public school.

Photo 60. One of the rural schools of Culross. Although this is still being used, others like it have been closed and the pupils transported by bus to the Teeswater schools.

Photo 61. Part of the site of the northern section of Formosa. This is looking west from the top of the hill across from which the church is situated.

Photo 62. Formosa's main street looking north up the hill. This is in the northern section.

Photo 63. The Roman Catholic Church, the centre of the village's religious life. The structure cost $50,000 to build in the 1870's.

Photo 64. The Formosa Spring Brewery, located in the southern section of the village.

Photo 65. A view of the brewery across the pond. This is taken from the road which runs to the Elora Road.

Photo 66. The Weiller Brothers Lumber Company. Piles of sugar maple await cutting to the finished product which can be seen piled on the wagon.

Photo 67. One of the two hotels in Formosa. This one is in the southern section.

Photo 68. One of the houses built in the area between the two sections. The rock outcrop separates the house from neighbouring houses.

Photo 69. A general store at Belmore. The chopping mill can be seen in the background.

CHAPTER V

SUMMARY AND CONCLUSIONS.

Culross Township is underlain by limestone formations, but the physical landscape is a result of modification by glaciation, especially glacial deposition and intricate glacial river dissection.

The climate is humid microthermal. The winters are characterized by heavy snowfalls. The original forest cover was deciduous. Throughout the township, soils of both good and poor fertility exist together, reflecting the differences in parent material and drainage. Although most of the soils are well drained, large areas of poorly drained soils do exist.

Permanent settlements by man were unknown before 1852, and there were no significant landscape changes before the advent of the white man. Both population and rural land ownership peaks were reached in 1881, when the population was 4,668, and the area of rural land owned was 57,478 acres of the total of 57,835. The rural economy was one of mixed farming, wheat being the most important crop. The village of Teeswater was acquiring industries geared to agriculture. The railway arrived in 1874.

After 1881, the economy changed. Wheat acreage declined and specialization in livestock, especially swine and cattle, began. The population declined slowly as people migrated to the large cities to the south-east, or to Western Canada.

From 1931 to 1962, the rural economy continued to follow the trend toward increased specialization in livestock. As a direct result,

mixed grains, hay, and oats became the important crops. Increased mechanization on the farm has given impetus to specialization.

There are seven geographic regions in Culross Township. Region I, an area of till plain and spillways, has fertile soils which grow hay and rotation pasture and small grains. Farmers here specialize in beef and dairy cattle and farms are large. Woodlot is relatively absent, being only at the backs of some farms. The village of Teeswater is in this region. Region II, also till plain and spillway, has some kame moraine. Hog specialization is important, and the size of both dairy and beef cattle herds is smaller than Region I. There is more area of woodlot here than in Region I because there is more rough land. The village of Belmore is in this region. Region III has till plain and spillway, but has no kame moraine. The raising of beef cattle, on smaller farms than in Region I is a specialization; but hogs and dairy cattle in combination are raised on the eastern margins of the region. Woodlots follow the poorly drained depressions. Formosa is located in Region III.

Region IV is isolated, to some extent, by the Greenock Swamp. On small farms, the farmers specialize in hogs, poultry, and cucumbers. Woodlots here too follow the poorly drained areas. Region V, an area of kame moraine and some till plain, has small farms. No one land use predominates. On the eastern margin, there is specialization in beef and dairy cattle. Region VI, also an area of kame moraine, is an area of mixed farming on small holdings. Considerable reforestation has been done in this region. The last of the seven regions is an area of depressional spillway. Swamp woodland predominates. Hogs and some

sheep are the main livestock on the farms on higher ground. Reforestation has also been carried out in this area.

The three villages, Teeswater, Formosa, and Belmore grew around nuclei of a grist mill, a saw mill, or both. The first two villages have an adequate number of industries; Teeswater and Formosa have industries that produce products marketed beyond the local area: powdered milk, butter, beer, lumber. Belmore, now only a cross-roads, was formerly more important. The trade areas of the three are related to their size and importance in Culross.

The physical setting of Culross has been important in determining the agricultural economy of the township. The soils and climate are conducive to the cultivation of small grains, corn, and hay and rotation pasture, fodder for large numbers of livestock. Moreover, glaciation has determined the relief, and internal drainage, rendering some areas in the Township more fertile and more productive than others, and partially isolating the western margins. Here the Greenock Swamp, and the steeply rolling kame moraine serve to inhibit agricultural specialization and the accompanying increase in farm size. Such influences are fundamental, but not all-important.

Culross Township's position in Southern Ontario, approximately 100 miles north-west of the densely populated industrial centres, and north-west of the major routeways, also has an important effect on the economy. Since these cities are the main markets for Ontario's farm products, Culross must compete with townships which are closer to the

cities and directly connected with them by highway or waterway and have, therefore, lower transportation costs. The Culross farmers and manufacturers, with reasonable success, however, have compensated for the increased transportation costs by producing high-grade products.

The people of Culross have also played a significant role in determining the economy of the township. Some farmers have turned to large scale specialization in beef cattle, dairy cattle, and hogs, enlarging their holdings and their herds as their income improved; other farmers in the areas of kame moraine and poorly drained soils have turned to a small scale specialization producing hogs, broilers, cucumbers etc. on smaller farms, and have had satisfactory monetary returns for their work. The manufacturers have concentrated upon producing products of good quality that are in demand in the market of Southern Ontario and beyond their own province. The businessmen have modern establishments that cater to the needs and desires of their customers. The result has been utilization of most of the advantages offered by the physical setting and surmounting of most of the disadvantages from distance and position.

Fluctuations in prices and changes in the demands of the public in Ontario could possibly terminate this prosperity, based almost exclusively on agriculture. The author would predict, however, from the observations and interviews made during this study, that the economy of Culross is relatively secure. The people of the township have shown that they can change the type and quantity of agricultural output to meet changing demands. Agricultural products will, moreover, always be in demand and Culross Township's specialization will probably be the kind that will be most profitable.

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APPENDIX I

Glacial Ages	Approximate Age (Yrs.)*	Interglacial Ages
Wisconsin	10,000-50,000	
Illinoian	300,000	Sangamon
Kansan	700,000	Yarmouth
Nebraskan	1,000,000	Aftonian

* The duration of each glacial age is considered to have been relatively short, of the magnitude of 50,000 years, while the interglacial ages were relatively long.

APPENDIX II

CROP ADAPTABILITY RATINGS OF SOILS IN CULROSS

1. Good Cropland

Soil Type	Wheat	Oats	Barley	Alfalfa	Fodder Corn	Pasture
Teeswater silt loam	good	good	good	good	good	good
Harriston loam and silt loam	good	good	good	good	good to fair	good

2. Good to Fair Cropland

Listowel loam	fair	good to fair	fair	fair	good to fair	good

3. Fair Cropland

Dumfries loam	fair	fair	fair to poor	fair	fair to poor	fair
Parkhill loam	poor	fair to poor	poor	poor	poor	fair

4. Fair to Poor Cropland

Donnybrook sandy loam	fair to poor	fair to poor	poor	fair	poor	fair
Waterloo sandy loam	fair to poor	fair to poor	poor	fair	poor	fair
Brady sandy loam	poor	fair to poor	poor	poor	poor	fair to poor

5. Poor Cropland

Gilford loam	poor	poor	poor	poor	poor	fair to poor

APPENDIX III

Acre-yields of some crops commonly grown in Culross Township

	Bushels			Tons
SOIL TYPE	WHEAT	OATS	MIXED GRAINS	HAY
Brady Sandy Loam	12	20	15	3/4
Burford Loam	30	40	40	1¼
Donnybrook Sandy Loam	15	25	20	1
Dumfries Loam	20	30	25	1
Harriston Silt Loam	45	60	60	2½
Harriston Loam	45	60	60	2½
Gilford Loam	--	10	8	3/4
Listowel Loam	35	45	40	2
Parkhill Loam	10	25	20	3/4
Teeswater Silt Loam	50	60	50	2½
Waterloo Sandy Loam	15	25	20	1

APPENDIX IV

1. Remaining Woodland (in Percent)

Township	1851	1861	1891	1911	1921	1931	1941	1951
Culross	100	89	25	12	11	12	14	10
Bruce	100	88	28	12	10	14	12	10
Greenock	99	72	43	19	22	24	24	16
Saugeen	100	85	43	13	17	19	15	15

2. Size Class

(Diameter percent)

Hardwood:

	CULROSS	BRUCE	GREENOCK	SAUGEEN
10"-18"	18	15	5	8
4"-10"	59	43	78	51
Under 4"	11	15	7	9

Mixed:

	CULROSS	BRUCE	GREENOCK	SAUGEEN
10"-18"	--	1	--	--
4"-10"	5	6	6	25
Under 4"	1	--	1	1

Conifers:	CULROSS	BRUCE	GREENOCK	SAUGEEN
10"-18"	--	--	--	--
4"-10"	2	2	1	6
Under 4"	2	1	--	--

3. Reproduction (percent)

	CULROSS	BRUCE	GREENOCK	SAUGEEN
Excellent	2	1	4	2
Good	18	17	23	26
Fair	59	58	67	51
Poor	23	24	6	21

4. Density (percent)

	CULROSS	BRUCE	GREENOCK	SAUGEEN
Over stocked	25	27	8	4
Well stocked	53	53	71	69
Under stocked	19	18	19	23
Sparse	3	2	2	4

CULROSS TOWNSHIP
PHYSIOGRAPHY

LEGEND:

KAME MORAINE :

TILL PLAIN:

SPILLWAYS:

DRUMLINS:

ESKERS:

Scale : 1 inch = 1 mile

MAP 1

CULROSS TOWNSHIP
SOIL MAP

LEGEND:

- HARRISTON LOAM & SILT LOAM
- LISTOWEL LOAM
- PARKHILL LOAM
- DUMFRIES LOAM
- DONNYBROOK SANDY LOAM
- WATERLOO SANDY LOAM
- BRADY SANDY LOAM
- TEESWATER SILT LOAM
- BURFORD LOAM
- GILFORD LOAM
- BREYPEN (VARIABLE)
- BRISBANE LOAM
- BOTTOM LAND
- MUCK

Scale : 1 inch = 1 mile

N

(AFTER O.A.C. SOILS DEP'T.)

MAP 2

CULROSS TOWNSHIP
LAND USE
1962

LEGEND:

SMALL GRAINS :

CORN :

ROW CROPS :

HAY & ROTATION PASTURE :

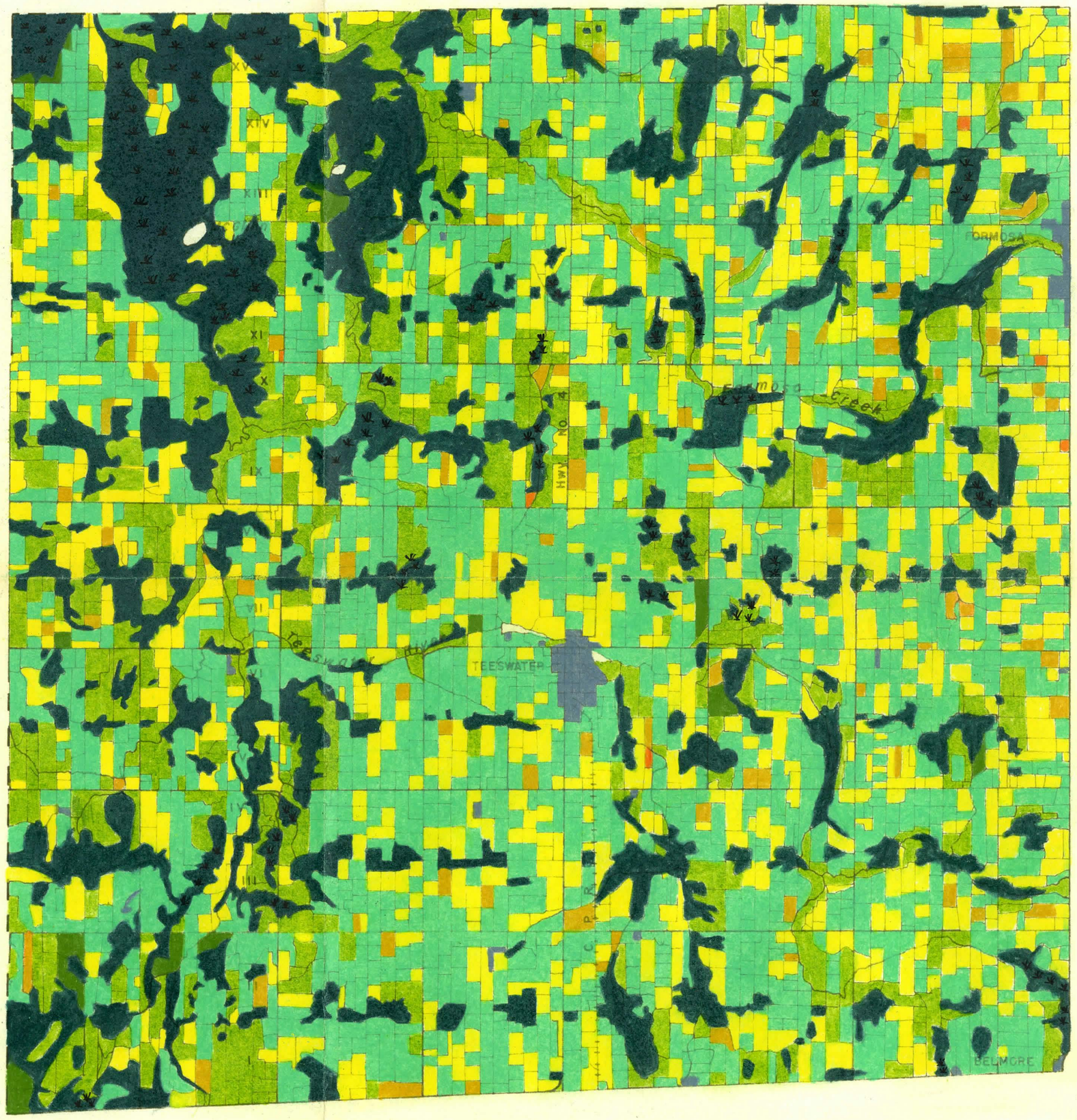
PERMANENT PASTURE :

WOODLAND :

SWAMP :

REFORESTATION :

NON-AGRICULTURAL :



Scale : 1 inch = 1 mile

N

MAP 3