SOIL SURVEY OF PARRY SOUND DISTRICT

Report No 31 of the Ontario Soil Survey

Prepared jointly by the Research Branch
Canada Department of Agriculture and
The Ontario Agricultural College

Canada Department of Agriculture, Ottawa
Ontario Department of Agriculture, Toronto

SOIL SURVEY

OF

PARRY SOUND DISTRICT

ONTARIO

by

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SOIL SURVEY MAPS AND REPORTS PUBLISHED BY COUNTIES

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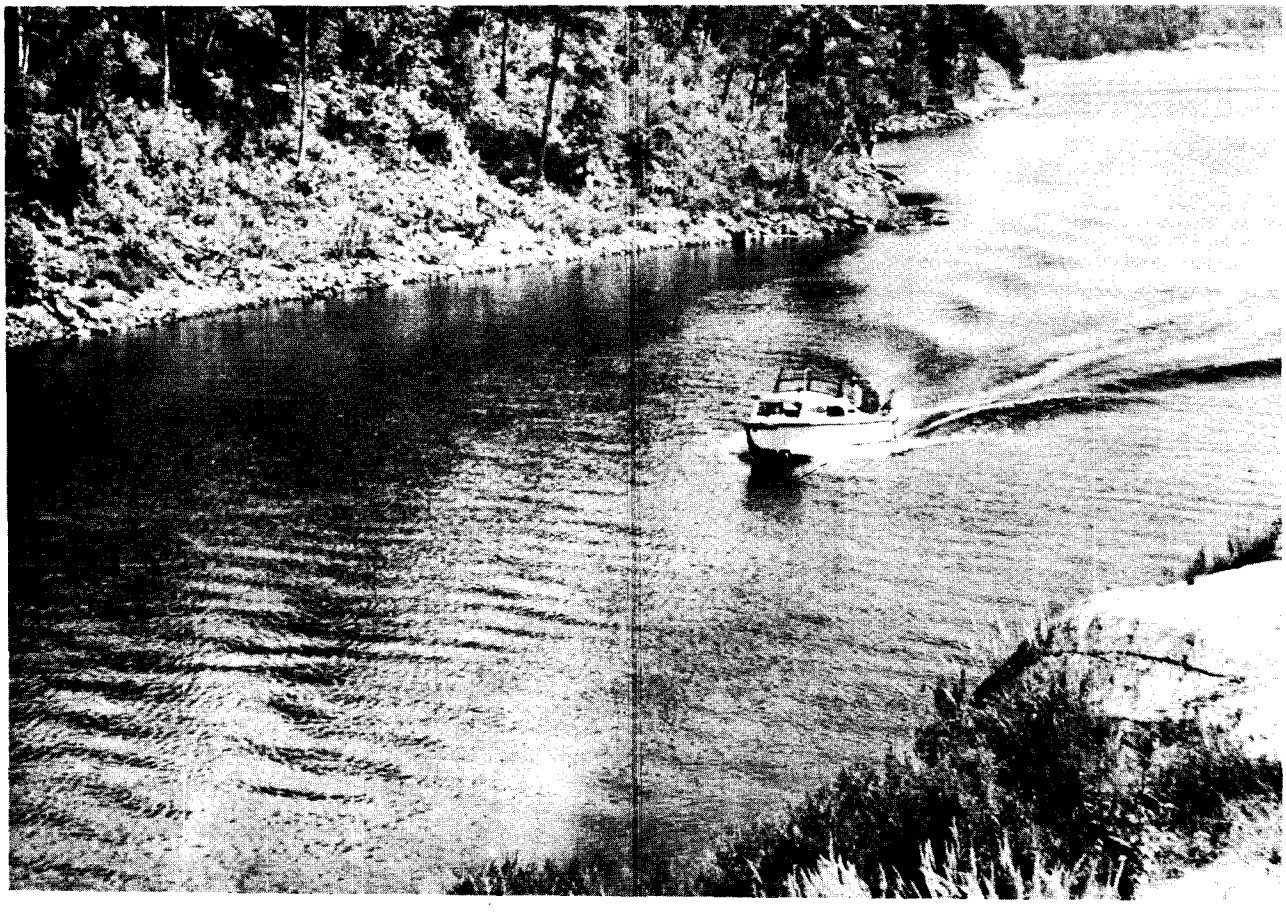


Many rivers in the District provide transportation and recreational facilities during the summer months.

Characteristic forest cover in the Parry Sound District.

The Soils of Parry Sound District

General Features

The district of Parry Sound is located in the north-western part of what is known as Southern Ontario. While this region is full of attractions to the tourist it is not as inviting to the agriculturalist. This district lies wholly within the Precambrian Shield, an area of dense hard rock consisting principally of granite. Rock knobs and hills interspersed with small lakes are therefore characteristic of the entire area.

The amount of soil material covering the rock varies considerably from place to place. Most of the hills are thinly covered by a stony till but there are many areas where bare rock occurs without any soil cover. The deeper soil deposits are composed of sands and silts which have been deposited either as glacial outwash or as beach deposits from early glacial lakes. Fine textured silty clay loam soils occur in low level lying areas and are lake sediments originating in glacial times.

More than eighty per cent of this district is unsuitable for agricultural use. Some of the stony rolling land could possibly be used as grazing land but the majority of these soils serve a more useful purpose in forestry. Soils which may be cultivated and used for the growing of agricultural crops are those occuring on the sand and clay plains.

The greatest concentration of arable soils occur in the vicinity of the towns of Nipissing, Powassan, Burks Falls and Magnetawan. Some herds of dairy cows are found in most of these areas but the numbers of cows in each herd are small. General types of farming are the rule in most of these areas. The type of farming carried on outside of these more favored areas would

appear to be self-sufficing, in which most of the products derived from the farm are used by the operator's family. For these latter operators other sources of revenue probably come from the sale of forest products. Some of the farmers in the district carry on a combination of agriculture and tourism.

Relief

The altitude of the district of Parry Sound rises gradually from 581 feet above sea level at Georgian Bay to an altitude of slightly over 1500 feet at its eastern boundary. Approximately one-half of the area has an elevation above 1000 feet.

The relief is typical of the Canadian Shield consisting of innumerable lakes separated by hills of granite rock that rise several hundred feet in height above the level of the lakes.

There are many rivers, the most important being the Sequin, Magnetawan, Pickerel, French and South. Some of these rivers apparently follow joint fractures within the bedrock.

Climate

The climate in the Parry Sound District is more moderate near the shore of Georgian Bay than in the inland region because of the modifying influence of the large body of water. Putnam and Chapman* have included a section of the district near Georgian Bay in their Muskoka climatic region and the inland part of the area in their Algonquin Park climatic region.

* Putnam, D. F., Chapman, L. J. Climate of Southern Ontario. Sci. Agr. Vol. 18, 1937-38.

The mean annual temperature in the Muskoka region is 40^{o} to 42^{o}. Winter temperatures vary from 14^{o} to 17^{o} and summer temperatures vary from 63^{o} to 65^{o}. The frost free period varies from 117 to 137 days and the growing period from 177 to 189 days.

Precipitation is heavy with an annual average of 38 inches. Snowfall is also heavy with averages as high as 130 inches annually being recorded.

In the part of the District included in the Algonquin Park climatic region the mean annual temperature is 39^{o}. Winter temperatures are 11^{o} to 15^{o} and summer temperatures are 62^{o} to 65^{o}. There is an average frost free period of 112 to 120 days with the possibility of killing frosts in any month of the year.

The average annual precipitation is 35 inches with an average snowfall of about 90 inches.

Area and Population

According to the 1956 Census the total land area for the District of Parry Sound is about 2,775,000 acres or 4,336 square miles. There are 304,339 acres of occupied farm land.

The total population is 28,095 (1956 Census). Although almost 77 per cent (21,553) of the people are rural dwellers, only 19 per cent (5,390) live on farms.

There are no cities in the District Parry Sound (5,378)*, Powassan (935), Kearney (454), and Trout Creek (438) are the towns and South River (995), Burk's Falls (902), Sundridge (697), Rosseau (223) and Magnetawan (197) are the villages in the District.

*Population figures from 1956 Census.

General Characteristics of the Soils

The soils occurring in the Parry Sound District are described in the following report. The area and location of the various soils for part of the District are shown on the soil map which can be found in the pocket inside the back cover. Aerial photographs of scale 1 inch = 1 mile were used for the original field mapping and the whole of the District was covered. However, since most of the western side of the surveyed area consists largely of rock outcrop no soil map has been published for this region. The published soil map covers only that part of the District having a fairly large acreage of deep soils and with some agricultural potential. This map has a scale of 1/2 inch = 1 mile. As a result some of the information gathered on the larger field maps has been omitted. Requests for more detailed information or for information for areas not shown on the published map should be directed to the Soil Science Department, Ontario Agricultural College, Guelph.

Boundaries between individual kinds of soil are drawn on the map and the kind of soil is identified by the use of colours and numbers. The name of each soil series or soil complex is listed in the legend accompanying the map.

Soils differ from one another in many ways and within any one region, these differences are due to variations in the rock materials from which the soils were derived and to the way in which the material was laid down. The sorting action of water produces a different deposit from that left by moving ice.

In general these differences can be recognized by the soil texture, that is whether it is sandy loam or clay loam or any one of a number of such

classes. Other characteristics by which soils may be differentiated are variables such as depth of soil material, drainage, stoniness and relief or lay of the land. A very important feature in soil that is not due to deposition or origin of the material is that which is caused by climate and vegetation. This effect is expressed in the soil by the development of layers or "horizons" that can be most easily recognized by colour.

The overall characteristic of the soil can best be seen by making a vertical cut in a bank or digging a hole in the soil to a depth of two or three feet. Such a cut made in a sandy soil will look like the picture shown in Fig. 1., A Soil Profile.

Surface - very dark brown

Sub-surface - white sand

Subsoil -yellowish brown

Substratum - brown to pale brown parent material

This soil has a dark brown surface about 2 inches in thickness. Underneath the surface is a white sand layer also 2 inches thick. Below this layer the subsoil is yellowish brown and becomes paler with depth and gradually fades into grey sand at a depth of 25 inches.

Soils with this kind of development are referred to as Podzols and all well drained soils in the Parry Sound District exhibit these characteristics or some modification of them. Podzol development is very faintly expressed on soils with clay or silty clay loam textures.

Soil Problems and Their Management

A soil that is ideal for growing crops may be described as one which is easy to work and in normal seasons will produce high yields of the crops suited to the climate of the area. Some soils are almost ideal in their natural state whereas others require some treatment to make them more suitable for growing crops. In addition, no soil will continue to give high yields unless certain materials are added to it from time to time to replace that which is being removed by the crop.

One of the most essential needs of a growing crop is water. In order to be productive, therefore, a soil must be moist. But too much water is also an undesirable condition and soils that are continually saturated with water or poorly drained are usually unproductive until the excess water has been removed. Any layers that occur below the surface such as a clay pan or solid rock and that prevent the excess water from seeping away will interfere with drainage. On the other hand, gravelly soils and some sandy soils allow too much water to percolate and there is not sufficient left for the growing crop.

Soils are therefore usually separated into three classes namely, well drained, imperfectly drained and poorly drained. Of these three classes the imperfectly drained and poorly drained soils need to be tile drained or drained by open ditches to make them suitable for growing crops.

The plant food that is used by the growing crop comes from the soil and a soil that contains enough to meet the requirements of the plant is spoken of as a fertile soil. The soils of the Parry Sound District are not fertile soils but in many cases they can be treated so that they will produce crops successfully.

In the first place they need LIME. Lime is especially necessary for alfalfa and clovers but it will also aid the grain crops and is therefore usually applied before the field is seeded to grain.

Every farmer is familiar with the benefits to a crop that is derived from the use of barnyard manure. Where soils are found to be very low in organic matter it may be necessary to plow down some clover crop to replenish the supply of this important soil material.

The nutrients that are needed most in a readily available form are the three supplied in commercial fertilizers namely, NITROGEN, PHOSPHATE and POTASH. The cooler the climate and the shorter the growing season the more necessary it is that these elements be added to the soil. The amount and kind of fertilizer to use for a particular crop is best determined by a soil test. Soil samples can be sent for analysis to the Soils Department, at the Ontario Agricultural College, Guelph. When hay and pasture crops become thin and weedy it is time to apply some nutrients in the way of manure or commercial fertilizers.

Soil Series and Soil Complexes

Soils developed from similar parent materials with similar profile features are classed as "series" and given a place name - for example "Magnetawan".

The term "soil complex" is used for those areas where there is a mixture of soil series in such a way that it has been impossible to map out the individual soils that do occur. It can be seen, therefore, that it is not possible to be as specific in regard to crop and fertilizer recommendations for such an area as it is in the areas where individual soils have been mapped out. In the main these soil complexes occur on the rough and rolling lands where cultivation for agricultural crops cannot or should not be carried on.

The term "soil phase" has also been used inthis survey for a different purpose than "series" and "complexes". The "phase" is used to show a variation within a given soil that is important from the standpoint of land use. For example, if the normal "Wendigo loamy sand" soil has no surface stone or field stone and an area occurs where there are a great many field stone, such an area has been mapped out and designated as "Wendigo sand-stony phase". The same system is used for any abnormal differences in the slope of the land so that such an area appears more rolling than the normal soil areas.

All the soils that occur in the Parry Sound District and their classification are given in Table 1.

TABLE 1

The Classification of Parry Sound Soils

Series	Family	Sub Group	Great Group	Parent Material
Berriedale	Berriedale	Orthic Podzol	Podzol	Non-calcareous, varved fine sandy loam and silt loam.
Doe	Doe	Orthic Gleysol	Gleysol	Non-calcareous, varved fine sandy loam and silt loam.
Englehart	Kenabeek	Orthic Gleysol	Gleysol	Non-calcareous sand underlain by clay at 3 feet or less.
Himsworth	Himsworth	Degraded Dark Grey Gleysolic	Dark Grey Gleysolic	Non-calcareous, varved silt loam and clay.
Kenabeek	Kenabeek	Orthic Gleysol	Gleysol	Non-calcareous sand.
Magnetawan	Magnetawan	Orthic Acid Brown Wooded	Acid Brown Wooded	Non-calcareous, varved silt loam and clay.
Mallard	Rubicon	Gleyed Podzol	Podzol	Non-calcareous sand.
Marsh	Marsh	Rego-Gleysol	Gleysol	Water saturated sand, silt or clay.
Monteagle	Wabi	Orthic Podzol	Podzol	Non-calcareous sandy loam till.
Muck	Muck		Organic	Well decomposed remains of leaves, mosses, etc.
Nipissing	Nipissing	Gleyed Podzol	Podzol	Non-calcareous, varved fine sandy loam and silt loam.
Otterskin	Mountain	Gleyed Podzol	Podzol	Non-calcareous sand underlain by clay at 3 feet or less
Peat	Muck		Organic	Partially decomposed remains of leaves, sedges, etc.
Powassan	Powassan	Orthic Gleysol	Gleysol	Non-calcareous, varved silt loam and clay.
St. Peter	Wendigo	Orthic Podzol	Podzol	Non-calcareous gravel.
Wendigo	Wendigo	Orthic Podzol	Podzol	Non-calcareous sand.

Soil Catena

Soil series developed on similar parent material, but differing in characteristics of the solum due to differences in drainage are included in the soil catena.

The soil catenas of the Parry Sound District are shown in Table 1.

TABLE 1

Catenary Relationship of Parry Sound District Soils

Catena Name	Catena Members		
	Drainage		
	Good	Imperfect	Poor
Berriedale	Berriedale	Nipissing	Doe
Bucke	Bucke*	Otterskin	Englehart
Magnetawan	Magnetawan	Himsworth	Powassan
Monteagle	Monteagle	Wemyss*	Christy*
St. Peter	St. Peter		
Wendigo	Wendigo	Mallard	Kenabeek

*Soils not mapped in Parry Sound District.

A livestock farm in the Parry Sound District. Weeds and thin grass are an indication of the low natural fertility of the soil.

SOIL KEY

	Acreage
A. Soils Developed on Glacial Till.	
I. Stony, non-calcareous sandy loam parent material.	
a) Good drainage	
1. Monteagle gravelly sandy loam (P)	26, 200
B. Soils Developed on Outwash	
I. Non-calcareous sand parent material.	
a) Good drainage	
1. Wendigo loamy sand (P)	30, 200
2. Wendigo loamy sand - rolling phase (P)	300
3. Wendigo loamy sand - stony phase (P)	500
4. Wendigo sandy loam (P)	3, 900
5. Wendigo sandy loam - rolling phase (P)	300
6. Wendigo fine sandy loam (P)	8, 000
7. Wendigo fine sandy loam - stony phase (P)	300
b) Imperfect drainage	
1. Mallard sandy loam (P)	3, 200
2. Mallard fine sandy loam (P)	200
c) Poor drainage	
1. Kenabeek sandy loam (G)	2, 400
2. Kenabeek fine sandy loam (G)	100

	Acreage
II. Non-calcareous sand overlying clay	
a) Imperfect drainage	
1. Otterskin sandy loam (P)	400
b) Poor drainage	
1. Englehart sandy loam (G)	2,200
III. Non-calcareous coarse gravel parent material.	
a) Good drainage	
1. St. Peter gravelly sandy loam (P)	11,500
2. St. Peter gravelly sandy loam - stony phase (P)	100
C. Soils Developed on Lacustrine Deposits.	
I. Non-calcareous fine sandy loam and silt loam parent materials.	
a) Good drainage	
1. Berriedale fine sandy loam (P)	6,400
b) Imperfect drainage	
1. Nipissing fine sandy loam (P)	500
c) Poor drainage	
1. Doe fine sandy loam (G)	1,100
2. Doe silt loam (G)	600
II. Non-calcareous silt loam and clay parent materials	
a) Good drainage	
1. Magnetawan silt loam (A. B. W.)	28,300
b) Imperfect drainage	
1. Himsworth silt loam (D. G. G.)	6,100

	Acreage
c) Poor drainage	
1. Powassan silt loam (G)	15, 300
D. Soils Developed on Organic Deposits	
a) Very poor drainage	
1. Muck	24, 900
2. Peat	32, 400
E. Miscellaneous	
1. Precambrian rocks	1, 800
F. Soil Complexes	
1. Rock - Monteagle sandy loam	2, 352, 300
2. Monteagle sandy loam - Rock	3, 100
3. Wendigo sandy loam - St. Peter gravelly sandy loam	900
4. Wendigo fine sandy loam - St. Peter gravelly sandy loam	39, 900
5. Rock - Wendigo fine sandy loam	400
6. Rock - Wendigo sandy loam	75, 400
7. Wendigo sandy loam - Rock	6, 800
8. Wendigo fine sandy loam - Rock	300
9. Rock - Powassan silt loam	1, 000
10. Powassan silt loam - Rock	600
11. Wendigo fine sandy loam - Magnetawan silt loam	3, 700
12. Magnetawan silt loam - Rock	29, 400
13. Himsworth silt loam - Rock	300
14. Rock - Magnetawan silt loam	42, 400

Great Groups

A. B. W. - Acid Brown Wooded

D. G. G. - Dark Grey Gleysolic

G - Gleysol

P - Podzol

SOIL DESCRIPTIONS

Monteagle Series

The Monteagle gravelly sandy loam soil occurs more frequently than any other in this District. It occurs on the rocky upland where rock outcrop is frequent and where the soil cover is generally thin. Occasionally the soil material overlying the rocks is deep but such areas are usually too small to be shown on the map. Where areas of thin and thick Monteagle soils occur in such close association with rock that they cannot be separated a soil complex has been mapped and is described more fully later on in this report. The Monteagle soil is developed from sandy granitic materials which are usually ten to twenty feet deep. Some variations are common in the soil material. This is in the degree of sorting that has been done by water. The soil near Highway 11 contains more sand, gravel and cobbles than that farther west.

The topography is rugged and slopes are steep, irregular and generally short. The soil is well drained but imperfectly and poorly drained areas are to be found in the depressions. The soil is very stony and has boulders at the surface and throughout the soil mass. Because of the steep slopes Monteagle soils

A Monteagle sandy loam profile. Note the large number of stones.

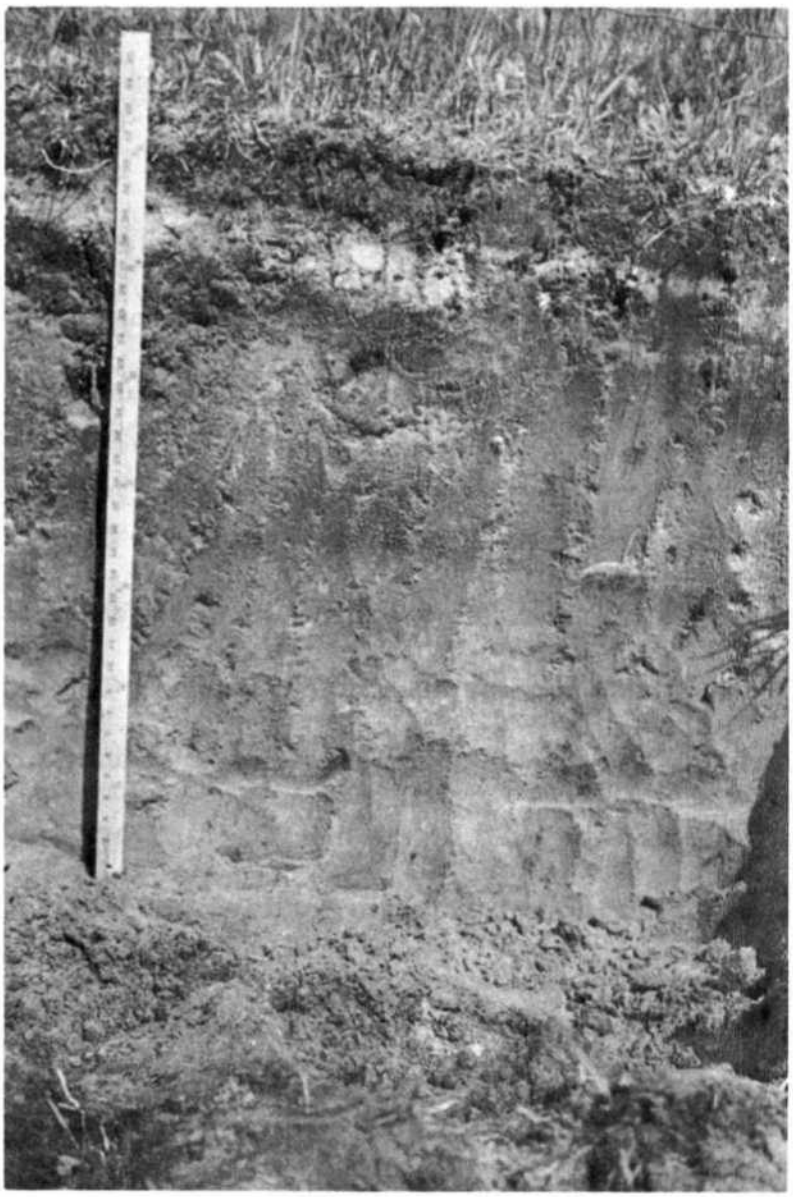
are very susceptible to erosion. However, since most of the soil has been kept under tree or grass cover soil loss has not been great.

This soil has been classified as a Podzol. As such it has the usual organic layer, one or two inches thick, followed by the white or bleached layer that is also one or two inches in thickness. The bleached layer is nearly continuous although in some burned over or cultivated areas it may be necessary to look closely in order to find it. The subsoil horizons are dark brown or brown in colour which at a depth of 20 to 36 inches grades into grey, stony and gravelly parent material.

Parts of the largest areas of Monteagle soil have been cleared and cultivation has been attempted. In the main these soils are too stony for cultivation but can be used for pasture and hay crops. The existing pasture lands are often weedy and growth of grasses is sparse in many areas. However, these pastures could be improved by the use of fertilizers and lime. It is likely that such an improvement program would not be worthwhile until there is a much greater need for land for agriculture.

Wendigo Series

The Wendigo soils are those which have developed on outwash sand, the largest typical areas occuring near the towns of Sundridge, Trout Creek and South River. The majority of these soils include sands ranging in size from medium to fine but some inclusion of coarse sand and gravel is inevitable in this kind of deposit.



A profile of Wendigo loamy sand.

These soils occur throughout the area occupied by the Precambrian Shield and therefore extend east to Renfrew and north to New Liskeard. They are typical podzols having a thin organic layer at the surface and underlain in turn by a white or light grey loamy sand layer and a yellowish or reddish brown layer that becomes paler with depth.

These are the most acid soils that occur in this region and since they are composed of nearly pure sand they have little value for agricultural purposes. Their moisture holding capacity is much too low to carry an agricultural crop through the critical dry periods.

Most of the land where these soils occur is quite rolling although there are some areas as in the vicinity of the Sundridge airport that the relief is fairly level.

Because of the ease of clearing and workability some of these soils are used for growing agricultural crops. Small areas are seeded both to hay and grain crops and subsequently used for pasture. Potatoes can be grown and yields are high where there is sufficient moisture and heavy fertilization. Blueberries do well but only the wild varieties are found. A good income might be realized from the cultivation of the blueberry crop.

At present most of this land should be reforested, particularly where slopes are steep or where wind has removed most of the surface soil. As the demand for land increases selected areas could be used for the growing of special crops.

Mallard Series

The imperfectly drained soils occurring on sandy outwash materials have been given the name Mallard. They are therefore associated with the Wendigo soils and occupy the lower slopes of the hills and the level areas where the water table is high for a certain part of the year.

The soil profile usually possesses a thicker white podzolized layer than is found in the Wendigo soil. Some iron pan formation is present in the subsoil which is also strongly mottled.

These are rather poor agricultural soils, but some use is at present being made of them as pasture.

Kenabeek Series

The poorly drained sand outwash soils associated with the Wendigo and Mallard soils have been given the name Kenabeek. These soils occur in the depressions and undrained basins and are therefore covered with water for a large part of the year. The horizons of the Podzol do not develop in this position and the profile is therefore lacking in the bright colors that characterize the better drained soils. Shallow black muck deposits are often found on the surface. These soils have a low suitability for agricultural use.

Otterskin Series

Imperfectly drained areas in which sand is underlain at depths of less than 36 inches by clay have been mapped and given the name Otterskin. These soils have much the same kind of drainage as the Mallard soils and therefore have a high water table for a certain part of the year. This imperfect drained condition can be recognized by the mottled colors of the subsoil. Although

somewhat similar to the Mallard soils they differ in being underlain by clay and lacking the iron pan layer in the profile. These soils have little agricultural value.

Englehart Series

The Englehart soils are associated with the Otterskin and occupy the poorly drained depressions. They consist of grey, strongly mottled sand overlying clay at a depth of 14 inches. These are low quality agricultural soils.

St. Peter Series

The St. Peter soils have developed from gravel outwash, coarse sand and possibly beach deposits. Much of the gravel is extremely coarse and may contain a fairly large percentage of cobblestones or small angular stones. These gravel materials are derived from granites and are similar in composition wherever they occur within this part of the Precambrian shield. They are therefore distributed throughout the Parry Sound and Nipissing Districts.

Podzol soils have formed but the thickness of the profile and the intensity of the colors are not as striking as in the Wendigo soils. The uncultivated soil possesses at the surface a thin layer of raw organic material accumulated from the forest vegetation. This is underlain by a white colored gravelly sand, for 2 inches in thickness and followed by a light yellowish brown loose gravelly sand that grades into the parent material at a depth of 18 inches.

These gravelly soils occur on rolling and level areas and large field stones may often occur scattered about on the surface. Some areas have been cleared and are being used for the production of hay and grain. The unsuitability of this soil for agricultural purposes is evident in some of these areas as they are abandoned and others planted to forest trees.

Berriedale Series

The Berriedale soils are deep fine textured soils that have developed under mixed coniferous-deciduous forest vegetation on fine and very fine sand deposits. These deposits probably originated as lake laid sediments as they are remarkably uniform in texture and often overlie stratified deposits of silt and clay.

They are strongly acid and would be important agricultural soils if the individual areas covered a larger acreage. Up to the present they have been recognized only in the Parry Sound District but their occurrence may be expected in adjoining districts.

The topography is rolling and some relatively steep slopes are therefore common. In many locations the Berriedale soils occur on the top of the knolls while silt and clay soils, mapped and designated as Magnetawan occur on the lower parts of the slope.

These soils have a yellowish brown profile colour which can be contrasted with the more striking reddish brown colour of the Wendigo series. In the uncultivated positions they have the normal podzol profile development.

As agricultural soils they are the best among the sandy textured soils that occur in this district. As stated previously acreages are small and their use is dependent on their proximity to other suitable soils. They are at present used for the growing of oat and hay crops. These soils might well be considered in the future for the production of market garden crops.

Crops respond to additions of phosphorus, potassium, nitrogen and lime. Lime is required mainly for the clover crops.

Nipissing Series

The Nipissing soils are the imperfectly drained soils associated with the Berriedale. They occur on gentle slopes and level areas where the water drains away slowly and where the water table is fairly high for a certain part of the year. They are developed from the same materials as the Berriedale soils but because of moisture conditions are cold and wet for a longer part of the year.

The podzol development is also present in these soils but is much less marked than in the better drained positions. They are strongly acid and therefore require the same fertilizer and lime treatments as are necessary for the Berriedale soils.

Doe Series

The Doe soils are the poorly drained soils associated with and developed from the same materials as the Berriedale and Nipissing. They occupy the depressions or places where the water is ponded for a major part of the year. As a consequence such soils are unsuitable for most agricultural crops unless drained. Because of their topographic position outlets are difficult to find and drainage can seldom be improved.

The soil profile lacks the colour and horizon development that is found in the better drained positions. the subsoil is uniformly grey and strongly mottled. They are acid to a depth of 30 inches but not as strongly acid as the better drained soils.

Magnetawan Series

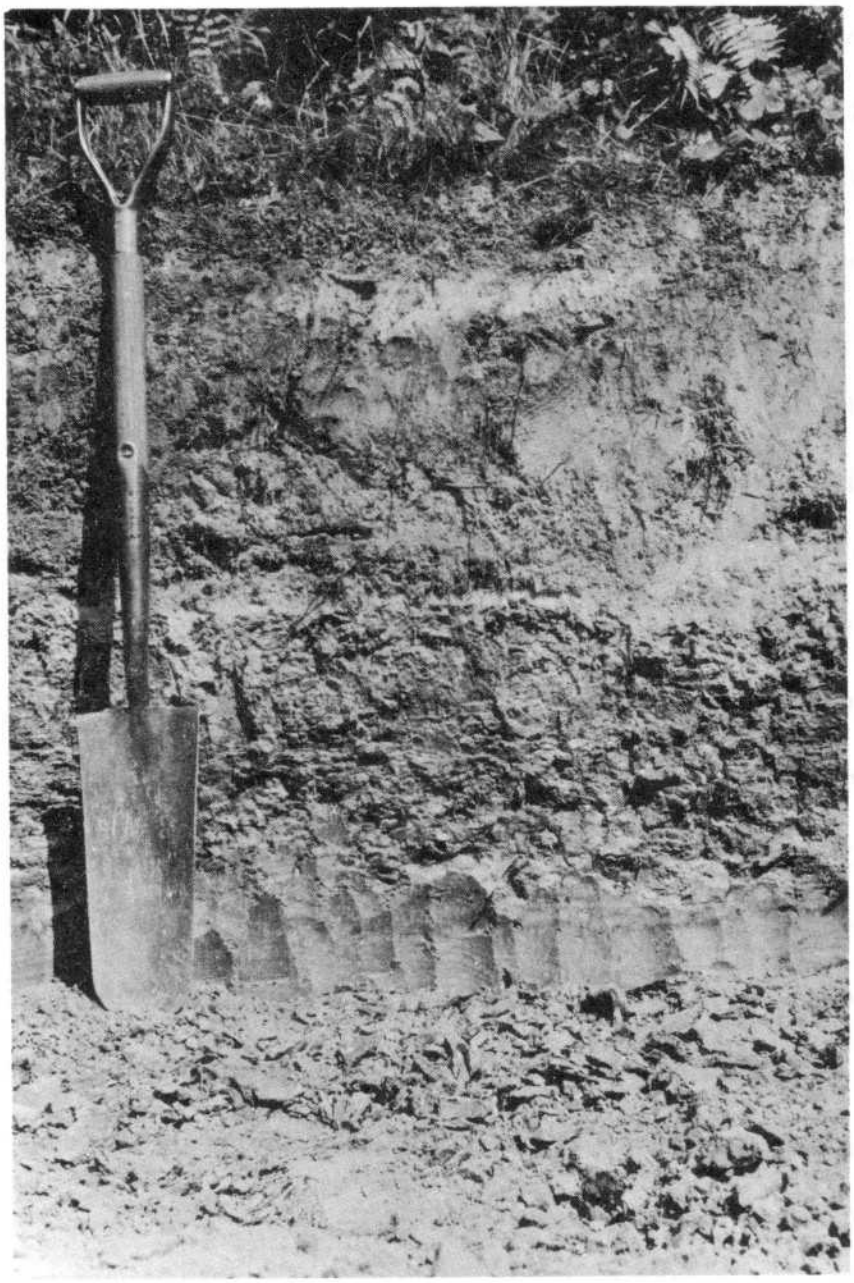
The Magnetawan soils are, from an agricultural standpoint, the most important soils that occur in the Parry Sound District. They are well drained soils developed on lake laid sediments of silt and clay in which silt is the predominant material. These sediments are associated with old glacial lakes such as Lake Algonquin and Nipissing.

Because of the nature of their deposition they occur in scattered areas and are found in the lower elevations within the rugged terrain. The present topography of these soils is not always level as water erosion has cut many channels through the sediments since they were originally laid down. The material is varved and the marking of the fine layers persists also in the soil profile.

These soils occur predominantly in the vicinity of Powassan, Nipissing, Magnetawan and Burks Falls and in all cases are small in area and surrounded by widely contrasting types of soil.

The soil profile is most easily distinguished by its grey slate-like colour. The upper 10 or 12 inches are soft and friable and therefore relatively easy to work. Below that depth the soil is hard and compact and in the drier part of the season has the nature of a hard pan. These soils are strongly acid and the portion of the profile immediately below the surface shows the horizons and colour development of the Acid Brown Wooded soils. These upper horizons contain more silt and less clay than the materials below them. None of these sediments are calcareous but they become less acid with depth and at a depth of 6 feet the reaction is slightly alkaline.

The agriculture that is attempted in Parry Sound District pretty well



Soil profile of Magnetawan silty clay loam.

depends on the distribution of these soils and the imperfect and poorly drained associated soils namely Himsworth silty clay loam and Powassan silty clay loam. Practically all of the Magnetawan soil areas are cleared and used in the production of hay, oats and mixed grains. Soil erosion may be expected to be severe on those fields cultivated for grain crops. The use of crushed limestone to correct the acidity for the production of hay and clover crops is probably as essential on these soils as it is on the more sandy textured soils occurring in the district. Advice should be sought from the local Agricultural Representative.

Since this soil is used for mixed farming there are usually sufficient livestock on hand to supply manure for the fields. The need for barnyard and green manure to maintain and improve soil structure cannot be overemphasized. In addition applications of phosphorus, potassium and nitrogen should be made when soil tests indicate the need.

In many fields the underlying hard pan is exposed on the surface because the more friable materials have been eroded away. The hard pan is most difficult to work except when moist. If worked when wet it puddles and structure is destroyed and when dry it is too hard to penetrate with most implements. The workability of the hard pan might be improved by the addition of large amounts of organic materials well worked in by some deep tillage implement.

Himsworth Series

The Himsworth soils are found in association with the Magnetawan and are of the same soil material but differ in being imperfectly drained. As a consequence they occur on the lower parts of slopes and on level areas where surface water does not accumulate.

The friability and open nature of the surface of the Magnetawan soils is lacking in these and they may therefore be expected to be less easy to work. The soil is acid and in a newly cultivated field has a light grayish colour. The subsoil is nearly always heavier in texture and during the dry summer months is very hard and compact.

These are among the most productive soils in the district. They are used for growing hay and spring grains and also as pasture land. The general type of farming is the most common although dairying as a special enterprise may be found in the vicinity of Burks Falls and Powassan. No large scale development is possible because of small acreages.

These are soils that require the uses of both lime and commercial fertilizers if they are to be used for growing hay and grain. The cultivation and harvesting of crops on these soils is less likely to be delayed if drainage is improved. Drainage can be improved by the installation of tile,open ditches or surface drains. Tile drains may not be satisfactory because of the compact nature of the soil materials.

Powassan Series

The Powassan soils are the poorly drained soils associated with the Magnetawan and Himsworth soils and derived from the same kind of soil material. These soils however have poor surface drainage and water collects and tends to remain at or near the surface for a large part of the year. In spite of their location these soils are used in general farming and they are frequently observed to carry some of the best hay crops that are produced in the entire district.

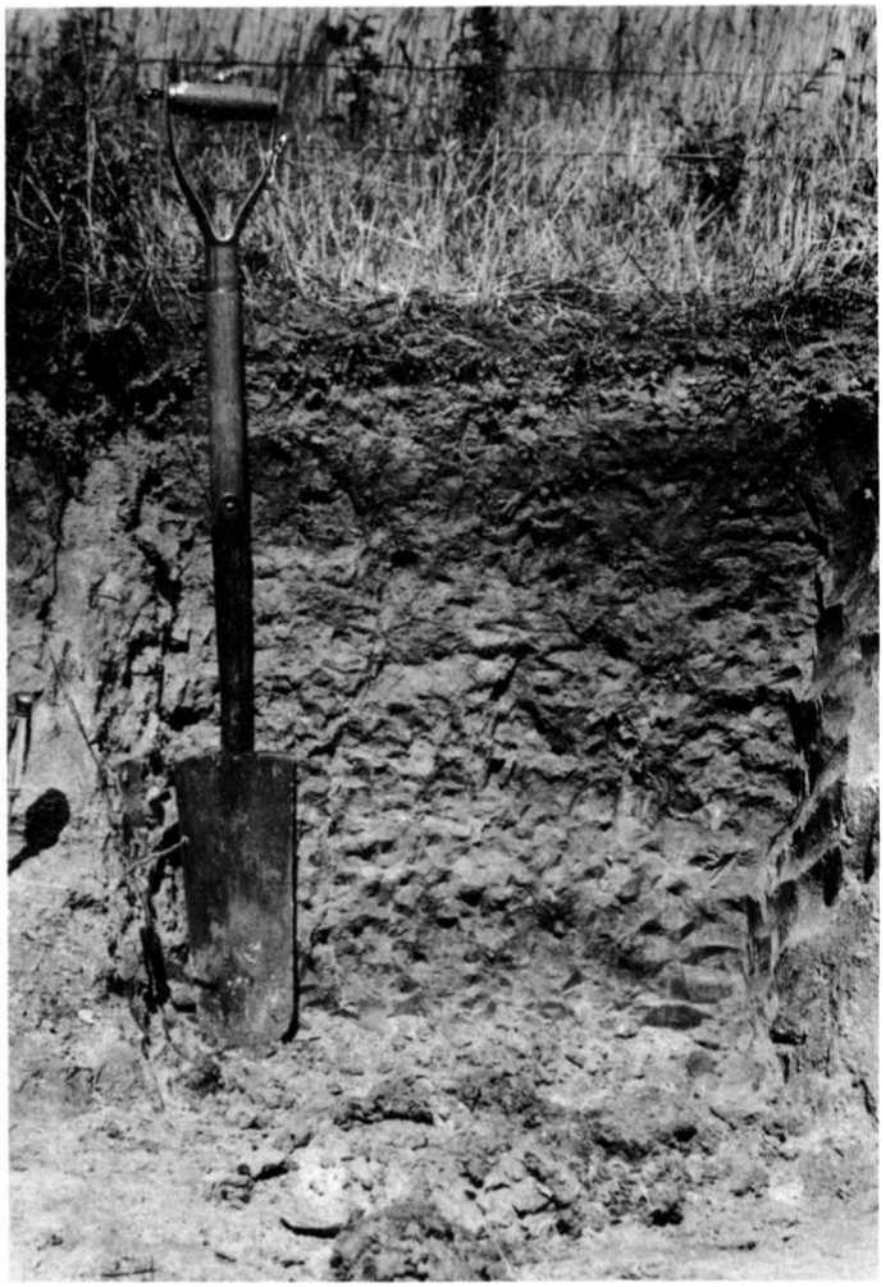
Although the surface texture of the majority of these soils is silty clay loam, clay soil areas are also common and in all cases the subsoil consists of a compact clay.

There are many areas that are not drained which would benefit from the use of surface drains and ditches. Surface drains have been adopted on soils of this kind in other parts of the Province with variable success. They are constructed by ploughing the land up in gently sloping ridges and leaving a dead furrow between the ridges. The excess water runs off the ridges into the furrows and down to the drainage outlet. Considerable skill is needed in order to obtain good results. For best results it is advisable to make the furrow as narrow as possible with the sides rising at about a 45 degree angle so that only a small amount of the subsoil is exposed. The ridges should not be too rounded as this causes too great an accumulation of surface soil in the centre of the ridge and exposes the subsoil in broad furrows. Fields with too rounded ridges and broad furrows give uneven and patchy growth. Heavy manuring along the furrows will result in a more even growth of crops.

The cultivated soil is acid and lime treatments may be necessary. Phosphorus and nitrogen are required for most crops and the amounts to be applied should be determined by a soil test. Both barnyard and green manures should be added to the soil to maintain soil structure.

Muck

Muck soils occur in various size areas throughout the district. In the main the individual areas are small but are relatively large in their total area.



Soil profile of Powassan silty clay loam.

These soils consist of over 12 inches of black, well decomposed organic material presumably derived from grasses and sedges. This layer rests on organic material that is only partially decomposed which in turn is underlain by sand, clay or bedrock.

Muck soils are not cultivated or used as crop land in this region. They occupy the lowest positions in the landscape and are therefore too cold and wet for agricultural crops. Because it is costly to improve muck land for agriculture, development should be discouraged until the demand for vegetables increases and then only the better areas should be used. Most of the muck soil areas in the District are best used for wildlife and water reservoirs.

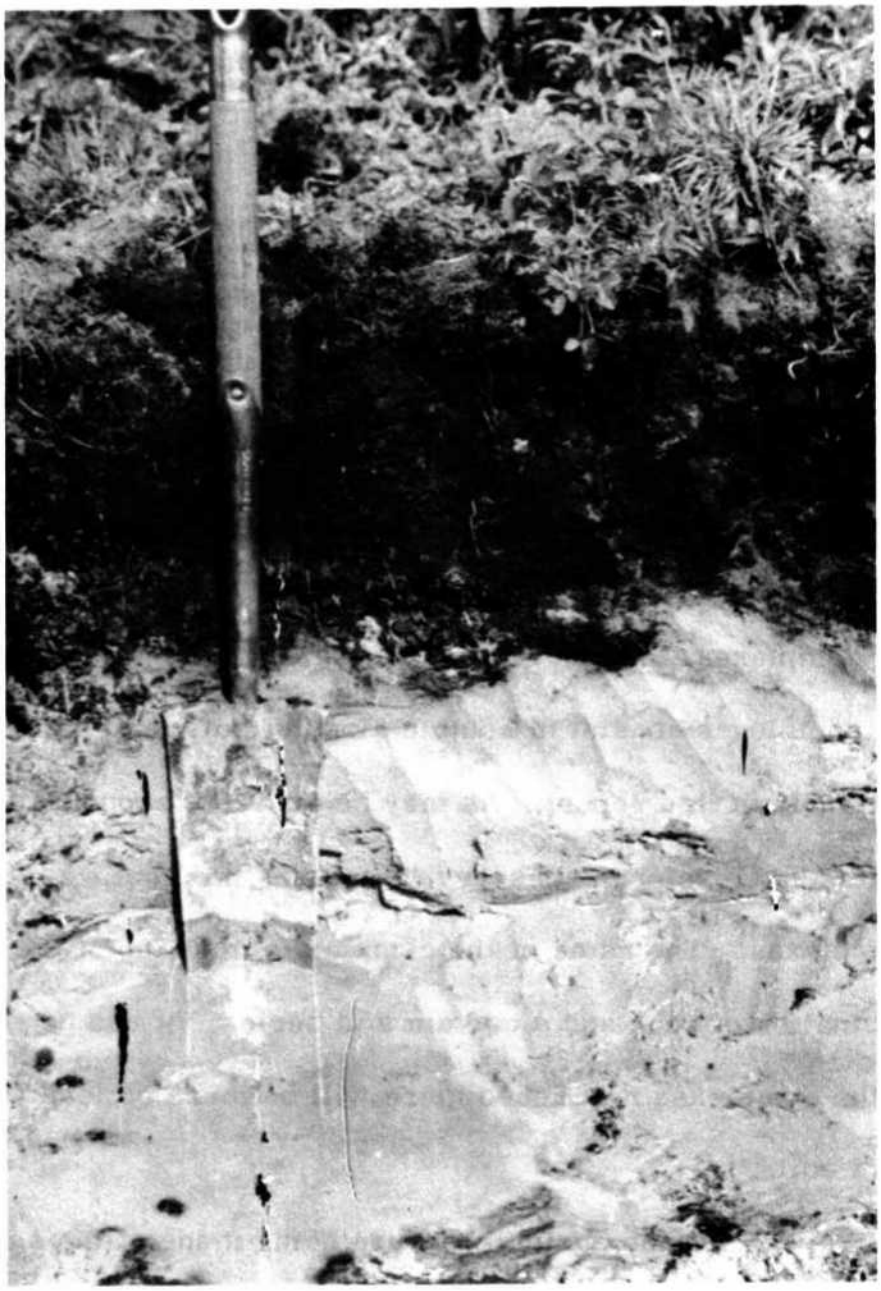
Peat

Peat soils occur in small areas and are distributed somewhat less widely than are the Muck soils. They consist of organic materials that have not undergone much decomposition. They are presumably derived from peat mosses which do not decompose very readily in this region.

Peat soils are not cultivated and are not suitable for agricultural purposes, but serve a useful purpose as a wildlife habitat.

Marsh

Areas that are covered by water for the entire year are mapped and designated as Marsh. These areas are covered by water loving plants such as cattails and sedges and by scrub vegetation chief of which is willow. The soil surface may consist of sand, clay or thin muck deposits. These areas are not suitable for agricultural purposes.



Muck soil underlain by sand.

Rock

Areas in which the bedrock occurs at the surface or where it is very thinly covered by some soil material have been mapped and designated simply as Rock. On these areas the natural forest vegetation is sparse and after a forest fire remain bare.

Soil Complexes

In much of the District of Parry Sound the land is rough and the soils are extremely variable. As a consequence it is not possible to map the individual soil series that occur on the scale of mapping used in this survey. In order to give a complete picture of the kinds of soil that occur in these areas they have been mapped as soil complexes.

These complexes consist of combinations of soil series that have been mentioned previously in this report. As may be expected exposures of bedrock are frequent and it is therefore necessary to include this feature as a part of some of the complexes. The name of the complex is made up of the two dominant soils or a combination of rock and a certain soil series. It can be expected that within each of the complexes mentioned there will be more or less small inclusions of other kinds of soils.

In general there is no agricultural use being made of the soils in these areas. The only exception being the complexes which include the series Magnetawan, Himsworth and Powassan. Since these series are composed of materials that are stone free the only hindrance to cultivation is the presence of bedrock exposures. Sometimes these occur so frequently that the land can only be used for pasture.

Rock - Monteagle Gravelly Sandy Loam

In total area this is one of the largest complexes that occur in the Parry Sound District. The greater part of the hilly and rolling areas are mapped as such. This complex is made up chiefly of rock with a thin covering of stony and gravelly material derived from granites and other hard rocks. The depth of soil over the bedrock varies from place to place, but in all cases it is very stony.

This complex is part of a much larger area that extends south into the Muskoka and Haliburton Districts and east into Nipissing and Renfrew. Since it has no value as an agricultural soil it need be discussed only in reference to its use for forestry.

There are many variations in the complex that have not been separated out on the scale of mapping used in this survey. Many of these variations can be expected to be of some significance in the growth of forest trees. Part of the area has a mantle of soil ten to twenty feet deep over the bedrock. In the greater proportion of the area the soil mantle is only a few feet or a few inches in thickness. Some variations are also common in the soil material itself. This is in the degree of sorting that has been done by water. Small knolls or pockets of sand are very common over the entire area and their occurrence bears no relation to present day streams.

Because of the difference in thickness of the soil mantle and the variations in the soil material there are wide differences in the amount of rainfall that is retained by the soil and that which enters the streams almost directly as runoff. These factors are of importance in the amount of moisture that is available for the forest vegetation.

Monteagle gravelly sandy loam - Rock

The Monteagle-Rock complex is similar to the Rock-Monteagle complex except the Monteagle gravelly sandy loam is the dominant type. This complex is used chiefly for pasture although oats and hay are grown where stones do not seriously interfere with cultivation.

Wendigo sandy loam - Rock
Wendigo fine sandy loam - Rock

These complexes are similar to those above except that the Wendigo soils are dominant. Although parts of each complex are used for pasture they should be reforested.

Wendigo loamy sand - St. Peter gravelly sandy loam
Wendigo fine sandy loam - St. Peter gravelly sandy loam

Both of these complexes are similar differing chiefly in the amount of fine sand present in the dominant Wendigo soils. The St. Peter gravelly sandy loam occurs in relatively small pockets with the Wendigo soils surrounding them. Mallard and Kenabeek soils usually occur in the level and depressional areas.

These complexes are used chiefly for pasture which is commonly thin and weedy. They should be reforested.

Rock - Wendigo fine sandy loam
Rock - Wendigo sandy loam

These complexes differ only in the amount of fine sand in the Wendigo soils. In addition to the dominant soils which name each complex are small areas of Kenabeek, Mallard and muck soils. Most of each complex is covered by trees and is unsuited to agriculture.

Wendigo fine sandy loam - Magnetawan silt loam

The Wendigo-Magnetawan complex consists of Wendigo fine sandy loam, Magnetawan silt loam, and small areas of Powassan silt loam. Slopes are steep and irregular and most of the land is very susceptible to erosion. Management of the land is difficult because of the steep slopes and the variability of drainage and texture. Most of the complex is used for pasture.

Magnetawan silt loam - Rock

Magnetawan silt loam is the principal soil type in this complex. Although numerous rock outcrops interfere with cultivation the land is used in much the same way and for the same crops described for the Magnetawan series.

Rock - Magnetawan silt loam

Less than half of this complex is composed of Magnetawan silt loam. However, the small strips of soil between the rock and muck are cultivated and used for the growing of hay, pasture and mixed grains.

Himsworth silt loam - Rock

The Himsworth-Rock complex is composed of Himsworth silt loam, rock and small areas of Powassan silt loam. The soil between the rock is cleared and cultivated and used for dairying or livestock raising.

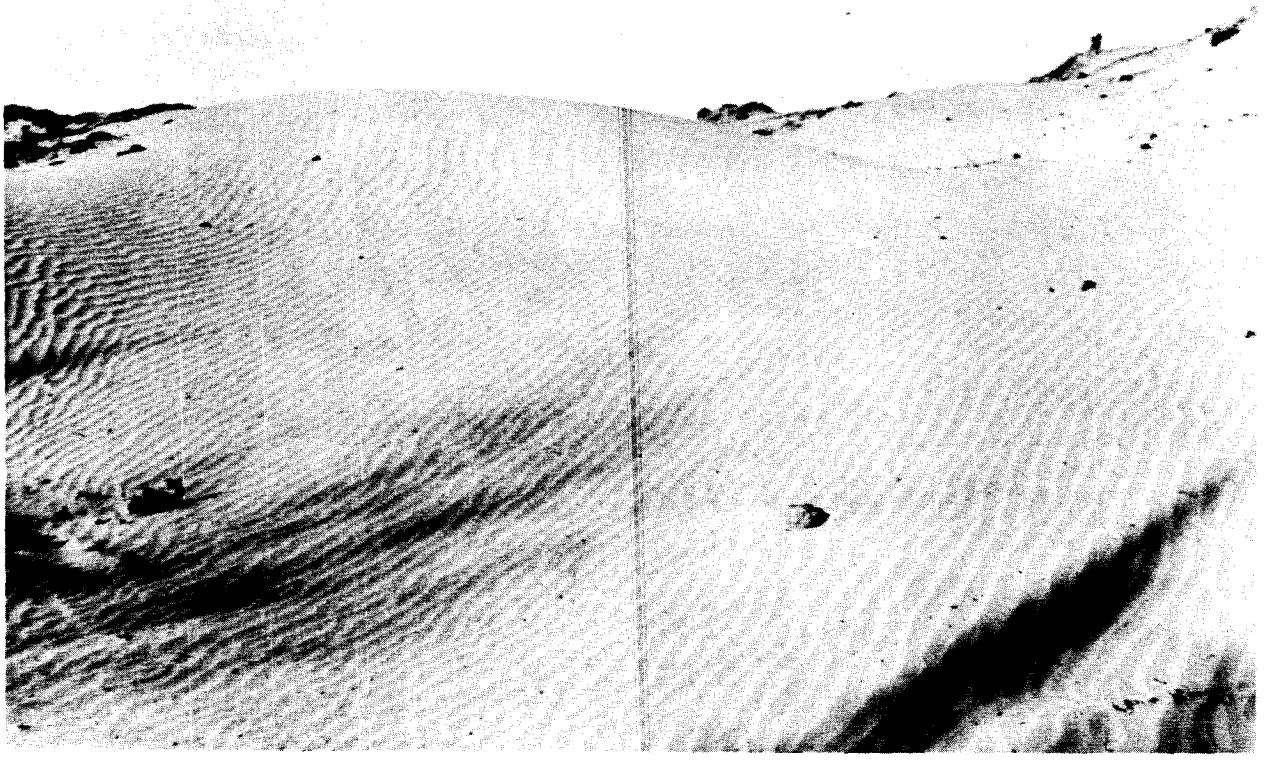
Powassan silt loam - Rock

The Powassan-Rock complex occurs only in small areas in the District. The Powassan silt loam, which is the dominant member of the complex is used for the same crops described for the Powassan series.

Oat crop being grown on Himsworth soils in the Himsworth-Rock complex.

Rock - Powassan silt loams

Rock is the dominant component of this complex in which Powassan silt loam and small areas of muck or peat are also included. Pasture and hay crops are grown on the Powassan silt loam. The use and management of the soil are similar to that described for the Powassan series. The rock and muck are used for the growing of trees although in most places the rock is almost bare.



Soil drifting on sand areas within the Wendigo - Monteagle complex.

The Formation of the Soils of the Parry Sound District

A knowledge of the factors affecting soil formation adds to the understanding of the soils in an area. Soil development processes are dependent upon a number of factors which include climate, vegetation, soil materials, relief and age.

Soil Materials

Soils develop from materials found at the surface of the earth and their characteristics are influenced to a large extent by the nature of these materials. Disintegrated rock particles constitute the soil skeleton. In many instances the composition of the soil is closely related to the underlying bedrock.

The bedrock of the district, except for a few small outliers of Paleozoic sediments, is entirely Precambrian in age. The Precambrian rocks are divisible into a number of groups. The oldest is a complex of gneisses which for convenience is divided into three groups. In one of these groups the gneisses are mainly biotite or garnet - biotite representing metamorphosed sandy and shaly sediments. The second group consists of hornblende gneiss or amphibolite with or without garnet. The third group are hybrid gneisses of sedimentary and igneous origin. This group underlies the greater part of the region.

Intrusive into the gneissic complex are diabase, gabbro, norite, anorthosite and more rarely lamprophyre and periodotite. The youngest igneous rocks are dikes of pegmatite.

Just south of Lake Nipissing and west of the village of Nipissing is a small outlier of paleozoic dolomite of Ordovician age.

Overlying the bedrock is a mantle of variable thickness of unconsolidated deposits of sand, gravel, boulders, till and clay of Pleistocene age left behind on the retreat of the continental glacier, deposited by glacio-fluvial streams or laid down in glacial lakes.

Parry Sound District falls within the area involved in the development of the Great Lakes and was covered in part by the waters of glacial Lake Algonquin and the Nipissing Great Lakes. Owing to the extremely hummocky nature of the country the shore lines of these lakes have not been worked out in detail, but that of Lake Algonquin is stated to pass through Bracebridge, Huntsville and Trout Creek and to the east of Lake Nipissing*.

The till deposits are made up of stones and boulders scattered through a matrix of sand, silt, and clay of varying proportions. It is very variable in thickness. Adjacent to No. 11 highway and therefore, paralleling the supposed position of the Lake Algonquin shoreline sand is widespread not only at low levels but even capping or forming hills. Sand deposits are also found in many other parts of the district. Gravel is common, particularly near some of the streams in the eastern part of the region. Varved clay occurs in the valley of the Magnetawan River and in the Powassan District.

* J. Satterly. "Mineral Occurences in Parry Sound District." Annual Report of Ontario Department of Mines, Vol. Ll, Part II, 1942.

APPENDIX

TAXONOMIC CLASSIFICATION, PROFILE DESCRIPTIONS AND ANALYTICAL DATA

In the following pages profile descriptions of each soil series are presented together with analytical data for selected soils. The analyses of surface samples are included to indicate comparative levels of plant nutrients in the surface soils of the District.

The methods of analyses were as follows:

Mechanical Analyses	-	Bouyoucos Hydrometer Method, Soil Science, Vol. 42, 1936, p. 225
Reaction	-	Atkinson H. J. et al., Contribution 169, Canada Department of Agriculture 1955.
Base Exchange Capacity and Exchangeable Bases	-	Schollenberger Method, Soil Science, 51:1, 1945.
Organic Matter	-	Walkley Method, Soil Science 63:251-264, 1947.
Calcium and Magnesium	-	Cheng Methods, Soil Science 72:449-558, 1951 and Soil Science 75:37-40, 1953.
Fusion Analysis	-	Robinson Method, Soil Science 59:7-9, 1945.

MONTEAGLE SERIES

Locality: Conc. XII, Lot 18, Strong Township

Parent Material: Coarse, stony, non-calcareous sandy loam till

*Classification:

Order	- Podzolic
Great Group	- Podzol
Sub Group	- Orthic Podzol
Family	- Wabi

Description:

A_o (L-H)** - 1-0 inches raw humus and roots, very dark brown (10YR2/2); pH 4.7

A_1 (Ah) - 0-$\frac{1}{2}$ inch gravelly sandy loam; very dark grey (10YR3/1); medium crumb structure; very friable consistency; very stony; pH 4.9

A_2 (Ae) - $\frac{1}{2}$-$1\frac{1}{2}$ inches gravelly sandy loam; grey (10YR5/1); medium crumb and single grain; very friable; very stony; pH 4.6

B_2 (Bfh1) - $1\frac{1}{2}$-10 inches gravelly sandy loam; dark brown (10YR4/3); weak medium nuciform; very friable; very stony; pH 5.1

B_3 (Bfh2) - 10-18 inches gravelly sandy loam; brown (10YR5/3); weak medium nuciform; very friable; very stony; pH 5.6

C_1 (C1) - 18-26 inches gravelly sandy loam; yellowish brown (10YR5/4); very weak medium nuciform; slightly compacted; very stony; pH 5 9

C_2 (C2) - Sandy loam till; light yellowish brown (10YR6/4); weak fine prismatic; moderately hard; very stony; non-calcareous; pH 5.9

WENDIGO SERIES

Locality: Conc. III, Lot 20, McKenzie Township

Parent Material: Very pale brown, non-calcareous sand

Classification:

Order	- Podzolic
Great Group	- Podzol
Sub Group	- Orthic Podzol
Family	- Wendigo

*The classification of each series into Soil Group and Family is made on the basis of definitions given by the National Soil Survey Committee 1960.

**New horizon nomenclature as suggested by the National Soil Survey Committee 1960.

Analyses of Monteagle Profile

Strong Twp., Lot 18, Conc. XII - Parry Sound

Horizon	Mechanical Analyses % Sand	% Silt	% Clay	pH	% O. M.	C. E. C. m. e. / 100 gm.	Exchangeable Bases Ca m. e. / 100 gm.	Mg m. e. / 100 gm.	K m. e. / 100 gm.	SiO_2%	Al_2O_3%	Fe_2O_3%	CaO%	MgO%	Na_2O%	K_2O%
A_1	69.4	26.2	4.4	4.9	2.57	10.62	0.48	0.21	0.08	76.7	12.5	3.9	2.1	0.8	2.8	2.3
A_2	68.4	27.2	4.4	4.6	0.63	2.71	0.27	0.14	0.03	79.2	13.8	1.2	1.2	0.3	2.6	2.1
B_2	64.8	29.8	5.4	5.1	0.91	4.65	0.51	0.17	0.07	73.7	13.2	4.1	2.4	0.6	3.1	2.1
B_3	70.4	22.4	7.2	5.6	0.23	3.52	0.49	0.19	0.04	73.9	13.6	3.5	2.4	0.7	3.2	2.1
C_1	71.6	20.0	8.4	5.9	0.00	2.30	0.56	0.21	0.03	74.1	13.4	3.2	2.6	0.9	3.5	1.9
C_2	70.2	21.8	8.0	5.9	0.00	2.18	0.57	0.20	0.03	73.8	13.5	3.3	2.6	1.1	3.6	1.9

Description:

A_o (L-H) - 2-0 inches raw humus and roots; black (10YR2/1); pH 4.4

A_2 (Ae) - 0-2 inches loamy sand; light grey (10YR7/1); single grain structure; loose consistency; stonefree; pH 4.7

B_2 (Bfh1) - 2-11 inches sand; dark yellowish brown (10YR4/4); single grain; loose; stonefree; pH 4.9

B_3 (Bfh2) - 11-26 inches sand; yellowish brown (10YR 5/6); single grain; loose; stonefree; pH 5.0

C (C) - Sand; very pale brown (10YR7/4); single grain; loose; stonefree; non-calcareous; pH 5.1

Analyses of the Above Profile of Wendigo Loamy Sand

Horizon	Mechanical Analysis % Sand 1-.05mm.	% Silt .05-.002 mm.	% Clay less than .002 mm.	pH	Exchange Capacity m.e./100 gms.	Ca m.e./100 gms.	Mg m.e./100 gms.	K m.e./100 gms.	Organic Matter %
A_2	81.8	11.8	6.4	4.7	3.68	0.67	0.26	0.07	0.43
B_2	88.9	7.9	3.2	4.9	5.51	0.59	0.21	0.08	0.97
B_3	95.7	1.3	3.0	5.0	3.14	0.68	0.26	0.05	0.35
C	93.6	4.4	2.0	5.1	1.06	0.13	0.11	0.04	0.00

MALLARD SERIES

Locality: Conc. III, Lot 9, Monteith Township

Parent Material: Very pale brown, non-calcareous, sand.

Classification:
Order - Podzolic
Great Group - Podzol
Sub Group - Gleyed Podzol
Family - Rubicon

Description:

A_o (L-H) - 2-0 inches raw humus and roots; black (10YR2/1); pH 4.8

A_2 (Ae) - 0-3 inches sandy loam; light grey (10YR7/1); single grain structure; loose consistency; stonefree; pH 4.5

B_2 (Bfhgl) - 3-14 inches loamy sand; dark reddish brown (2.5YR3/4); mottled; single grain; ortstein often present; stonefree pH 4.8

B_3 (Bfhg2) - 14-19 inches loamy sand; red (2.5YR5/8); mottled; single grain; slightly cemented; stonefree; pH 4.8

C_1 (C1) - 19-23 inches sand; reddish yellow (7.5YR6/6); mottled single grain; loose; stonefree; pH 5.0

C_2 (C2) - Sand; very pale brown (10YR7/4); mottled; mottles brownish yellow (10YR6/6); single grain; loose; stonefree; non-calcareous; pH 5.0

ENGLEHART SERIES

Locality: Conc. XXV, Lot 26, North Himsworth Township

Parent Material: Non-calcareous sand underlain by non-calcareous silt loam or silty clay loam at depths of less than 3 feet.

Classification:

Order	- Gleysolic
Great Group	- Gleysol
Sub Group	- Orthic Gleysol
Family	- Kenabeek

Description:

A_o (L-H) - 1-0 inches raw humus and roots; black (10YR2/1); pH 4.6

A_1 (Ah) - 1-3 inches sandy loam; very dark greyish brown (10YR3.2); fine crumb structure; very friable; stonefree; pH 4.8

G (Bmg) - 3-20 inches loamy sand; grey (10YR6/1); very mottled single grain; loose; stonefree; pH 5.0

D (II) - Silty clay loam; pale brown (10YR6/3); very mottled; massive; plastic when wet, hard when dry; stonefree; non-calcareous; pH 5.8

ST. PETER SERIES

Locality: Conc. VII, Lot 3, Machar Township

Parent Material: Non-calcareous, coarse, gravel.

Classification:

Order	-	Podzolic
Great Group	-	Podzol
Soil Group	-	Orthic Podzol
Family	-	Wendigo

Description:

A_o (L-H) - 1-0 inches raw humus and roots; black (2.5Y2/0); pH 4.8

A_2 (Ae) - 0-1 inch gravelly loamy sand; light grey (2.5Y7/2); single grain structure; loose consistency; slightly stony; pH 4.9

B_2 (Bfhl) - 1-6 inches gravelly loamy sand; olive brown (2.5Y4/4); single grain; loose; very stony; pH 5.1

B_3 (Bfh2) - 6-19 inches gravelly sand; light olive brown; (2.5Y5/6); single grain; loose; very stony; pH 5.3

C (C) - Coarse gravel; light yellowish brown (2.5Y6/4); single grain; loose; slightly stony; non-calcareous; pH 5.3

KENABEEK SERIES

Locality: Conc. III, Lot 32, Gurd Township

Parent Material: Very pale brown, non-calcareous, sand.

Classification:

Order	-	Gleysolic
Great Group	-	Gleysol
Sub Group	-	Orthic Gleysol
Family	-	Kenabeek

Description:

A_o (L-H) - 2-0 inches raw humus and roots; black (10YR2/1); pH 4.8

A_1 (Ah) - 0-2 inches sandy loam; very dark greyish brown (10YR3/2); fine crumb structure; very friable consistency; stonefree; pH 4.8

G (Bmg) - 2-17 inches loamy sand; light brownish grey (10YR6/2); very mottled; single grain; loose; stonefree; pH 5.1

C (Cg) - Sand; very pale brown (10YR7/3); very mottled; single grain; loose; stonefree; non-calcareous; pH 5.1

OTTERSKIN SERIES

Locality: Conc. X, Lot 6, Machar Township

Parent Material: Non-calcareous sand underlain by non-calcareous silt loam or silty clay loam at depths of less than 3 feet.

Classification:

Order	-	Podzolic
Great Group	-	Podzol
Sub Group	-	Gleyed Podzol
Family	-	Mountain

Description:

A_0 (L-H) - 3-0 inches raw humus and roots; very dark greyish brown (10YR3/2); pH 4.1

A_2 (Ae) - 0-4 inches sandy loam; light grey (10YR7/2); single grain structure; loose consistency; stonefree; pH 4.2

B_2 (Bfhgl) - 4-12 inches sandy loam; dark brown (10YR4/3); mottled; very weak medium nuciform; loose; stonefree; pH 4.5

B_3 (Bfhg2) - 12-17 inches loamy sand; brown (10YR5/3); mottled; single grain; loose; stonefree; pH 4.5

D_1 (IIC1) - 17-22 inches silt loam; light yellowish brown (10YR6/4); very mottled; laminar; firm; stonefree; pH 5.5

D_2 (IIC2) - Silty clay loam; pale brown (10YR6/3); massive; plastic when wet; hard when dry; stonefree; non-calcareous; pH 5.7

BERRIEDALE SERIES

Locality: Conc. IX, Lot 17, South Himsworth Township

Parent Material: Non-calcareous varved fine sandy loam and silt loam.

Classification:

Order	-	Podzolic
Great Group	-	Podzol
Sub Group	-	Orthic Podzol
Family	-	Berriedale

Description:

A_o (L-H) - 1-0 inches raw humus and roots; black (10YR2/1); pH 4.5

A_2 (Ae) - 0-1 inch fine sandy loam; white (10YR8/2); weak fine platy structure; soft consistency; stonefree; pH 4.8

B_2 (Bfh1) - 1-6 inches fine sandy loam; yellowish brown (10YR5/6); fine crumb; soft; stonefree; pH 5.1

B_3 (Bfh2) - 6-13 inches fine sandy loam; light yellowish brown (10YR6/4); fine crumb; soft; stonefree; pH 5.1

C_1 (C1) - 13-19 inches fine sandy loam; very pale brown (10YR8/3); weak medium nuciform; vesicular; soft; stonefree; pH 5.2

C_2 (C2) - Fine sandy loam and silt loam varves; very pale brown (10YR7/3); laminar; plastic when wet; hard when dry; stonefree; non-calcareous; pH 5.2

NIPISSING SERIES

Locality: Conc. XI, Lot 2, McMurrich Township

Parent Material: Non-calcareous, varved fine sandy loam and silt loam.

Classification:

Order	-	Podzolic
Great Group	-	Podzol
Sub Group	-	Gleyed Podzol
Family	-	Nipissing

Description:

A_o (L-H) - 2-0 inches raw humus and roots; black (2.5Y2/0); pH 4.5

A_2 (Ae) - 0-2 inches fine sandy loam; light grey (2.5Y7/2); very weak fine platy structure; soft consistency; stonefree; pH 4.3

B_2 (Bfhgl) - 2-10 inches fine sandy loam; dark reddish brown (2.5YR3/4); mottled; weak fine nuciform; soft; stonefree; pH 4.5

B_3 (Bfhg2) - 10-20 inches fine sandy loam; olive brown (2.5Y4/4); mottled; weak medium nuciform; very friable; stonefree; pH 4.5

C (C) - Fine sandy loam and silt loam varves; fine sandy loam light brownish grey (2.5Y6/2); silt loam light yellowish brown (2.5Y6/4); friable; stonefree; non-calcareous; pH 4.7

DOE SERIES

Locality: Conc. X, Lot 27, Armour Township

Parent Material: Non-calcareous, varved fine sandy loam and silt loam.

Classification:

Order	-	Gleysolic
Great Group	-	Gleysol
Sub Group	-	Orthic Gleysol
Family	-	Doe

Description:

A_o (L-H) - 1-0 inches raw humus and roots; black (2.5Y2/0); pH 4.7

A_1 (Ah) - 0-2 inches fine sandy loam; very dark greyish brown (2.5Y3/2); fine crumb structure; very friable consistency; stonefree; pH 4.8

G(Bmg) - 2-15 inches fine sandy loam; light brownish grey (2.5Y6/2); very mottled; massive; friable; stonefree; pH 5.3

C (Cg) - Fine sandy loam and silt loam varves; fine sandy loam light brownish grey (2.5Y6/2); silt loam light yellowish brown (2.5Y6/4); very mottled; stonefree; non-calcareous; pH 5.4

MAGNETAWAN SERIES

Locality: Conc. XI, Lot 15, Christie Township

Parent Material: Non-calcareous, varved silt loam and clay.

Classification:

Order	-	Brunisolic
Great Group	-	Acid Brown Wooded
Sub Group	-	Orthic Acid Brown Wooded
Family	-	Magnetawan

Description:

A_o (L-H) - 1-0 inches raw humus and roots; very dark brown (10YR2/2); pH 5.7

A_1 (Ah) - 0-1 inch silt loam; dark greyish brown (2.5Y4/2); fine granular structure; friable consistency; stonefree; pH 5.9

B_2 (Bfhl) - 1-4 inches silt loam; light olive brown (2.5Y5/4); fine granular; friable; stonefree; pH 5.6

B_3 (Bfh2) - 4-15 inches loam; light yellowish brown (10YR6/4); fine nuciform; friable; stonefree; pH 5.5

C_1 (IIC1) - 15-18 inches clay loam; light grey (10YR7/2); very weak fine platy; vesicular; firm when wet;;very hard when dry; stonefree; pH 5.4

C_2 (IIC2) - 18-22 inches clay; pale brown (10YR6/3); coarse blocky; slightly vesicular; plastic when wet; very hard when dry; stonefree; pH 5.4

C_3 (IIC3) - 22-29 inches clay; yellowish brown (10YR6/4); coarse blocky; very plastic when wet, very hard when dry; stonefree; pH 5.7

C_4 (IIC4) - 29-36 inches clay and silt loam varves; clay light yellowish brown (10YR6/4); silt loam white (10YR8/2); plastic when wet, very hard when dry; stonefree; non-calcareous; pH 5.7

C_5 (IIC5) - Same as C_1; pH 5.8

HIMSWORTH SERIES

Locality: Conc. XI, Lot II, Ryerson Township

Parent Material: Non-calcareous varved silt loam and clay..

Classification:

Order	-	Gleysolic
Great Group	-	Dark Grey Gleysolic
Sub Group	-	Degraded Dark Grey Gleysolic
Gamily	-	Himsworth

Description:

A_p (Aa) - 0-7 inches silty clay loam; greyish brown (10YR5/2); fine nuciform structure; friable consistency when dry; plastic when wet; stonefree; pH 6.1

A_2 (Aeg) - 7-16 inches silty clay loam; light grey (10YR7/2); mottled vesicular; weak fine platy; very hard when dry; plastic when wet; stonefree; pH 5.0

Analyses of Magnetawan Profiles

Profile #1 - Christie Twp. Lot 15, Conc. XI - Parry Sound

Horizon	Mechanical Analyses			pH	% O.M.	C.E.C. m.e./100 gm.	Exchangeable Bases			SiO_2%	Al_2O_3%	Fe_2O_3%	CaO%	MgO%	Na_2%	K_2O%
	% Sand	% Silt	% Clay				Ca m.e./100 gm.	Mg m.e./100 gm.	K m.e./100 gm.							
A_1	22.8	50.0	27.2	5.9	14.51	31.6	16.1	1.5	0.24	68.9	14.9	6.9	2.4	0.8	2.6	2.6
B_2	18.8	57.6	23.6	5.6	5.84	27.6	9.3	0.8	0.15	70.6	15.9	7.1	2.3	0.9	2.4	2.7
B_3	29.2	43.8	27.0	5.5	3.55	21.7	6.6	1.1	0.11	62.2	13.3	6.9	2.0	1.1	3.0	2.4
C_1	21.2	42.2	36.4	5.4	0.41	13.7	5.1	0.7	0.09	66.3	18.0	6.6	1.9	1.3	2.5	2.4
C_2	18.0	38.8	43.2	5.4	0.26	15.2	9.2	2.1	0.14	66.7	22.1	6.8	2.7	1.4	2.7	2.8
C_3	7.0	45.8	47.2	5.7	0.10	14.2	10.4	2.2	0.23	66.9	19.7	6.8	2.8	1.4	2.6	2.8
C_4	8.8	44.4	46.8	5.7	0.05	14.3	10.6	2.1	0.18	65.8	17.6	6.5	3.0	1.6	2.5	2.6
C_5	7.9	45.1	47.0	5.8	0.05	14.0	10.3	2.3	0.16	66.1	17.8	6.6	3.0	1.6	2.4	2.4

Profile #2 - Nipissing Twp. Lot 4, Conc. III - Parry Sound

A_1	23.0	57.6	19.4	4.8	14.68	30.4	12.5	1.9	0.34	66.6	14.2	5.8	2.4	1.4	2.3	2.5
B_2	22.5	59.2	18.3	5.2	4.72	26.6	8.6	0.7	0.12	68.3	16.1	6.7	2.3	1.5	2.0	2.8
B_3	29.4	52.1	18.5	5.6	3.09	19.8	5.9	1.0	0.11	62.2	13.9	5.6	2.1	1.7	2.5	2.4
C_1	11.2	54.0	34.8	5.2	0.78	10.0	4.9	0.8	0.12	71.2	15.6	4.5	2.1	1.8	2.6	2.7
C_2	7.0	31.0	62.0	6.0	0.95	22.0	14.2	3.6	0.31	61.7	18.8	7.8	2.8	2.0	3.0	3.3
C_3	6.6	41.6	51.8	6.6	0.31	15.2	12.6	2.0	0.28	61.4	17.3	7.1	2.8	2.0	2.4	3.1
C_4	5.4	49.0	45.6	7.2	0.25	13.6	12.8	2.4	0.19	59.9	16.4	6.3	3.9	1.4	2.2	2.7
C_5	6.0	48.2	45.8	7.3	0.24	14.0	13.4	2.4	0.17	59.3	16.9	6.7	3.9	1.5	2.4	2.9

B_2 (Bfhg) - 16-23 inches clay; light brownish grey (10YR6/2); mottled; coarse blocky; very hard when dry, very plastic when wet; stonefree; pH 5.7

C (C) - Silt loam and clay varves; clay light yellowish brown (10YR6/4); silt loam white (10YR8/2); plastic when wet, very hard when dry; stonefree; non-calcareous; pH 5.7

POWASSAN SERIES

Locality: Conc. I, Lot 30, Patterson Township

Parent Material: Non-calcareous varved silt loam and clay.

Classification:

Order	- Gleysolic
Great Group	- Gleysol
Sub Group	- Orthic Gleysol
Family	- Powassan

Description:

A_p (Aa) - 0-9 inches silty clay loam; very dark brown (10YR2/2); medium granular structure; friable consistency when dry, plastic when wet; stonefree; pH 6.2

G_1 (Bmgl) - 9-17 inches silty clay loam; greyish brown (10YR5/2); massive; tough; very plastic when wet; stonefree; pH 6.5

G_2 (Bmg2) - 17-39 inches silty clay loam; light grey (10YR7/2); very mottled; mottles yellowish brown (10YR5/8); massive; tough; very plastic when wet; stonefree; pH 6.5

C (C) - Silt loam and clay varves; clay light yellowish brown (10YR6/4); silt loam white (10YR8/2); very hard when dry, very plastic when wet; stonefree; non-calcareous; pH 6.5