

Manitoba, Saskatchewan and Alberta that the largest, most continuous areas of the richest soils occur. Many of these soils, as analyses show, are veritable mines of plant food. Without entering upon any discussion as to relative agricultural values of the arable lands of our several Provinces it may suffice to say that the indications are that fertilizers will be found more particularly helpful in the Maritime Provinces, in Quebec and in British Columbia.

With regard to the climatic conditions which govern the fertility of the soil and the use of fertilizers, Dr. Shutt referred to the heavy rainfall and temperatures of the coastal regions, where conditions were important influencing factors. Reference was also made to the fact that the Canadian winter locks up for several months, practically from harvest to seeding time, the soil's fertility, particularly that form of plant food known as nitrates, which in a mild and open climate would leach from the soil.

#### Conclusions and Generalizations from Experimental Data.

For ten consecutive years, from 1900 to 1909, a series of fertilizer experiments were conducted on the Experimental Farms at Brandon, Manitoba, and Indian Head, Saskatchewan. The results taken one year with another fail to indicate any material increase in the yields of the fertilized over those of the unfertilized plots. There was no consistent increase due to any fertilizer and in no case was the increase sufficient to cover the cost of the fertilizer. These experiments, it must be noted, were conducted on excellent soil of high quality and wheat was the crop used. Furthermore, experiments carried on at a number of experimental stations located in Northern Saskatchewan and Alberta failed to indicate any specific want of plant food in the soil. On the whole, therefore, results have been of a negative character. Experimental work in British Columbia has been conducted largely on the Experimental Farm at Agassiz, eighty miles from the coast. The soil being of a poor, gravelly, or sandy nature. The results have been somewhat irregular, varying with the character of the season, but emphatic evidence has been obtained as to the effectiveness of fertilizer applications in conjunction with manure, more especially on the mangel crop. The most profitable results have been obtained from the use of a complete fertilizer made up according to the following formula: nitrate of soda 100 to 160 lbs., superphosphate 350 to 400 lbs., and muriate of potash 100 to 200 lbs., these amounts being per acre. On the Central Experimental Farm at Ottawa, investigational work of this character has been going on since 1888, and it should

be added that the work at Ottawa has included the comparison of fresh with rotted manure, the manurial value of clover as compared with farm manures and fertilizers, and the testing out of a number of materials not generally recognized as fertilizers.

Perhaps one of the most remarkable results obtained has been the discovery, that so far as ordinary farm crops are concerned, fresh and rotted manure applied at the same rate give practically equal yields. In this connection Dr. Shutt said: "The explanation for this is not easy to find since rotted manure, weight for weight, is very considerably richer in plant food than fresh manure. It probably lies in the better inoculation of the soil with desirable nitro-organisms for the conversion of soil plant food into an assimilable form by the fresh manure, and the warmth set up by its fermentation in the soil affecting the crop beneficially in its early stages. But, be this as it may, we have the practical deduction that there is no concomitant gain from the use of rotted manure in the ordinary farm rotation, for the labor involved in rotting it and the large losses in organic matter and plant food that inevitably accompany the operation. The quicker the farmer can get the manure into the land, or on to the land, the better, for it is never worth more than when first produced." Concerning the manurial value of clover it has been demonstrated over and over again that a crop of clover in the rotation has a manurial effect equal to an application of farm yard manure of ten to fifteen tons per acre.

Concerning results from commercial fertilizers on the Central Farms, experiments have shown a marked deficiency in the soil, though the response to nitrogenous fertilizer is perhaps the most pronounced. Almost invariably the increases have been larger and more profitable from the complete fertilizer than from an application of any one or two of the fertilizer constituents.

While in general farming fertility cannot be economically maintained and profitable yields obtained by the exclusive use of fertilizers, experiments have shown that fertilizers may be used to good advantage in conjunction with farm manure. When manure is scarce or has to be purchased at a high price then it will assuredly be found desirable to make an outlay for fertilizers, not to take the place of manure but to supplement its scanty use. Dr. Shutt emphasized this point throughout his paper, driving home the point throughout many periods of his address that only in conjunction with good soil management, plenty of humus, obtained either through manures or green crops, can fertilizers be used to the best advantage.

No profitable response has been obtained from the

direct application to the soil of finely ground untreated phosphate (apatite). Basic Slag has proven the most profitable phosphatic fertilizer on sour soils, on heavy clay loam, on soils naturally deficient in lime, on peats and mucks, while superphosphate on lighter soils rich in lime, has given the quickest returns, especially for turnips and cereals. On land in fair condition a top dressing of nitrate of soda applied in the early weeks of growth has been found beneficial to grass, more particularly when intended for hay. No potassic fertilizer has proved more valuable than good hardwood ashes. Of the three essentials potash appears to be the least needed, but on many light loams it has given a good return.

#### Fertilizers in Eastern Canada.

Deductions made from the work at Ottawa hold good in the main for Eastern Canada. There is, however, apparently a larger and more lucrative field for fertilizers in the East, arising out of the condition that the crops upon which they are used are more particularly money crops, such as potatoes, apples, etc., from which a larger money return can be expected. If the maximum gross returns per acre are in the neighborhood of \$150 rather than \$50, it is obvious that the prospect for a remunerative response from fertilizer is greatly enhanced. The importance of manure and clover in maintaining the humus content of the soils has been emphasized in the strongest way in all experimental work in Quebec and the Maritime Provinces. On potatoes and market garden crops generally an application of manure at the rate of fifteen tons per acre with a moderate application of a well-balanced fertilizer has given more profitable returns than either thirty tons of manure or a dressing of 800 to 1,000 pounds of a similar fertilizer without manure. The majority of experiments have shown that excessively large dressings of fertilizer have not given net profits per acre of the same magnitude as medium applications, say 400 to 600 pounds, and farmers are counselled to ascertain for themselves by experiment and the employment of an undressed area or check plot what the limits of profitable application are on their soils. There is no laboratory method by which this can be done. In conclusion the speaker said: "Our experiments in general have gone far towards establishing that a judicious and rational use of fertilizers may be depended upon to yield a profit; that the exclusive use of fertilizers will neither keep up the fertility of the soil nor yield profitable returns; that it is on soils of medium rather than poor quality that a lucrative response from their employment is to be expected; and lastly, that it is on the money crops that we shall find the application most profitable."

## The Possibilities of Northern Ontario.

EDITOR "THE FARMER'S ADVOCATE":

New Ontario is divided into several districts, but the one which I am most familiar with is known to-day as the Nipissing District. This District is divided and the north part is called Timiskaming. Timiskaming is divided into Liskeard and Englehart Districts, while the north part is known as the clay belt. This clay belt extends not only across Timiskaming but also into Algoma, and we do not know as yet how far north.

The greatest mining areas of the Dominion are found in Timiskaming, although at Sudbury in Algoma the two largest nickel mines in the world are situated. The third largest mine, found so far, is farther north near the Monteith Farm. These three nickel mines produce over eighty per cent. of the world's supply of nickel. Ontario thus has a corner on nickel.

New Ontario is known to be the richest silver area in the world. It also has one of the richest gold mines in the world at Munroe, in Munroe Township. In this township is a fine lot of farming land with most of the timber all burned off, and thousands of acres almost ready for the plow. In this township there is a large out-cropping of rock in one place, and here (it seems) some prospector strolled along some ten years ago or more and found on the rocky area an out-cropping of gold. He immediately proceeded to hide his find and stake his claim. He bored four holes in the rock and covered this spot of gold over with an iron plate and then covered the spot with earth and went away and tried to peddle mining stock, with the result that he sold his claim for a few hundred dollars. The second holder was a better promoter and he sold his claim, so I am told, for about one thousand dollars, and he in turn sold it for fifteen hundred dollars to another man. This poor fellow was not a very good promoter, and after holding the claim for several years he told me that he was very glad to get rid of it even at a loss. When he sold, however, three Jews from New York took over the claim, and at once proceeded to investigate the surface gold which had been found some years before. After they had dug seventy-five feet they had taken out seventy-five thousand dollars' worth of gold, and I am told that they are still digging the shaft and have already taken out two million dollars' worth. Some of you who were at Toronto Exhibition, perhaps, saw a large piece of quartz about the size of a coal scuttle, which was taken from this mine and contained ten thousand dollars' worth of gold. This is a very rich mine, considered as one of the richest finds in the world. You may ask, why did the former owners sell so cheaply? The fact is they did not know what they had, and they were afraid to blast off the surface for fear that they would blow the bottom out of the mine.

I believe that there are hundreds, yes hundreds, of

mines in the North Country to-day, many of which will prove to be very rich, and there are still hundreds of prospectors exploring the country and millions of acres which have not been explored at all as yet. The North Country is a wonderfully rich country and becoming richer all the time. In 1914 twenty-four million dollars' worth of minerals were mined in Ontario, and mostly in Timiskaming. While the mineral wealth is the greatest source of attraction in the North Country at present, the forest is becoming more attractive from year to year.

The timber of Northern Ontario is made up chiefly of spruce, balsam, pine, poplar and balsam of gilead. Pine is not found very plentifully in the northerly parts but spruce and balsam are found everywhere. The trees are not large as a rule, and it is a rare thing to find a spruce tree three feet in diameter at the butt, most of them averaging about ten inches or a little more. This accounts for cheap land clearing.

The spruce is by all means the most important, both for lumber and pulp. About 250 miles north of North Bay, pulp and paper mills have been built, one mill having cost about \$5,000,000 and another almost as much. The logs are floated down the river to the mills, where they are rossed and then ground into pulp and finally worked into paper.

Spruce, balsam and white wood lumber is being regularly shipped to Toronto to be used mostly for rough flooring or siding. Some of the white woods (poplars and balsam of gilead) finish up very nicely, and can be used for inside work or even for some kinds of furniture. It is being used more and more each year for these purposes. There are millions of acres of spruce still untouched which will become more valuable from year to year.

After the lumber and pulp has been taken off it is necessary to clean the land for agricultural purposes.

At the present time agriculture work is progressing very rapidly. This is especially true in some of the sections where District Representatives have been placed within the last few years. At the present time there are eight Representatives in Northern Ontario stationed at Kenora, Emo, Port Arthur, Fort William, Sault Ste. Marie, Sudbury, New Liskeard and Monteith.

As I am more particularly acquainted with the agriculture in Timiskaming, it may be of interest to you to know about our District. The District is naturally divided by a ridge of high land which divides two large water-sheds. To the north the water flows into James Bay and the agricultural land is known as the great Clay Belt, and to the south we have a stretch of farming land known as the New Liskeard and Englehart District. This latter has been developing very rapidly.

Some of the New Liskeard farmers came in there about fifteen years ago, but most of them came in more

recently. To-day they have rural telephone and mail routes, and are thinking of starting a creamery. The government has offered to start this for them and operate it until it is put on a paying basis, when it will be handed over to the farmers.

Thousands of bushels of peas are shipped out of the District each year for seed. This seed goes to large seed houses in Toronto or elsewhere and we lose our identity. The pea weevil is unknown, and heavy yields are quite commonly seen over the whole district each year. Farmers in Old Ontario should get in touch with the District Representatives of the North, and thus be able to purchase their seed direct from Farmers' Clubs in the North.

Clover seed can be produced and heavy yields are very often threshed from the first cutting of the season. The second cutting rarely produces much matured seed, as the season is too short. The crops in the New Liskeard District were very fair this year, and most of the farmers had their seed all sown by May 15.

Going farther north over the height of land to the clay belt proper we find settlers' clearings much smaller. This is due, of course, to the fact that settlers have more recently come to this District, and in many cases the land is not taken up at all even near the railroad. The Timiskaming and Northern Ontario railroad runs almost straight north from North Bay to Cochrane, and it has some small branches running east and west. The present settlers are nearly all settled within a few miles of this road, and there are hundreds of thousands of acres still available all along the Transcontinental Railroad which runs through the clay belt. This land can be bought for fifty cents an acre, and when it is cleared it is very productive, as has been very clearly demonstrated on the Monteith Demonstration Farm and Breeding Station.

The Monteith Demonstration Farm is located 218 miles north of North Bay, and is just 35 miles south of Cochrane, which is on the Transcontinental Railroad. The government has reserved 800 acres here for agricultural purposes. The T. & N. O. Railway runs through the farm, which makes it very convenient for visitors to see it.

For three years in succession our first seed went into the ground on May 5th. This year we had quite a dry spring, while in Old Ontario it seemed to be pouring rain very day. Our weather continued to be quite dry all summer, and this made clearing easy for the settlers. Hundreds of them were putting forth every effort to clear their land by means of fire, and just here I might mention that the awful forest fire was not one great wholesale drive of fire which began in one place and drove across the country full blast. Most of our people