stemming the ravages of the potato disease; and second, a constant supply of new varieties. This latter is the only way yet discovered of securing a full crop in adverse seasons. Were these two objects attained a great national benefit would be the result. The number of acres devoted to this crop, for instance, might be greatly reduced. Instead of having 1,300,000 acres planted, to insure the raising of an adequate supply for our requirements, it would be found that the requisite quantity (5,000,000 ton) could be grown on about 1,000,000 acres. This would represent a saving in seed alone of about £750,000. And it is a very moderate estimate to reckon the labor, manure, and rent of the 300,000 acres set free for other purposes at £10 per acre, or £3,000,000 annually.

When there is a lack of potatoes, the tendency is towards a greatly increased scarcity as the season advances. There are three reasons for this. The seed demand being generally about the same from year to year, the quantity required in spring for this purpose is a larger percentage of the available stock in a season of scarcity. Second, potatoes are of inferior keeping quality if touched by disease when still growing; and consequently a large percentage apparently sound in autumn become tainted during the winter.

Another result to be obtained by the discovery of a cure for potato disease, would be the better quality of the roots, from their being grown only on land well suited in every respect for their cultivation. At present the uncertainty of the crop, while it restricts the acreage on suitable soils, tends also to increase it in districts where other crops could be grown to better advantage. The great risk of failure makes the farmer of really suitable soil for the growth of potatoes cautious in determining the number of acres which he will devote to this crop. On the other hand the chance of the considerable profits sometimes made from the crop, induces the occupier of land not well suited by its own nature or its proximity to easy means of conveyance, to risk the cultivation of this precarious root, when he would be more profitably employed in growing turnips.

Sir John Lawes, the English Farmer-Baronet, gives the results of a Hunt for Nitrogen in the *Country Gentleman* of 10th January. One of the earliest facts arrived at during the Rothamsted experiments—40 years ago—was that the yield of wheat under mineral manures could be largely increased by an application of Ammonia; another, that the quantity of nitrogen in the manure could never be accounted for in the increased crop. Failing to find an explanation in the giving off of Ammonia in the plant, or in the assumption that the seasons had not been sufficiently favourable for the crop to use all the manure applied, Sir John began to look into the drainage water. He remarks as follows:—

"Finding that the winter drainage was rich in nitric acid in proportion to the quantity of ammonia applied in the autumn to the wheat, we very naturally set to work to stop this waste by applying these salts of ammonia in the spring. On one experiment the autumn application was continued. We have, therefore, two experiments in which the mineral manures are the same, but not sown at the same time. The wheat on both is sown the same day, but the same quantity of ammonia is sown, on one at the end of October and on the other in March. The crop of wheat grown by the autumn sown ammonia is less than that sown in the spring; but the difference is not so great as might be expected. The amount of nitric acid which passes through the autumn sown ammonia drains is very large, and, as nearly as we can estimate it, makes up with that taken up in the crop nearly the whole applied.

"For instance, in the year 1880-81 57 pounds of nitrogen was applied in the autumn. It was estimated that 57 pounds passed away as drainage, while the increased crop contained 26 pounds. While there was plenty of rain to wash the spring sown ammonia into the soil and subsoil, there was not sufficient to cause the drain to run until the wheat was cut and carried. In October the drain ran, and toward the end of the month samples of the soil were taken on each experiment, in several places, to the depth of 27 inches, and the nitric acid was determined. The excess in the soil where the ammonia was spring-sown over that which received the ammonia in the autumn was not more than 11 pounds per acre. It is evident, therefore, that while we are able to account approximately for the whole of the nitrogen in the autumn-sown ammonia, there is a considerable quantity in that which is spring-sown which does not appear as nitrogen in the crop or as nitric acid in the drainage water or soil. What then has become of it? Has it been destroyed? We know that nitrates when in contact with organic substances are reduced to ammonia, or even to nitrogen gas, if oxygen is absent. Has a portion of the ammonia entered into combination with the soil as such, and not been converted into nitric acid, or has the nitric acid got below the drain pipes? Although there was no drainage, it is quite possible that water might descend below 27 inches without the drain running.

These suggestions by no means exhaust the probabilities of what might occur. It is evident, however, that even in regard to the action of ammonia upon one crop only, the hunt is in full vigor, and the quarry likely to baffle our pursuit for many a long day. I have brought forward these results because they have an important bearing upon the application of these costly substances. Whether it will pay a United States farmer to use nitrogen, as salts of ammonia, or nitrate of soda, is a question upon which I do not venture to offer an opinion. When they are used, I would point out that with the much hotter and drier weather in the States, there is some danger of salts of ammonia failing to act upon the growing crop, if sown late in the spring. Under these circumstances, nitrate of soda would be a profitable substance to apply.

"It should be understood that several operations have to take place before a salt of ammonia assumes the form of nitrate of lime. The sulphate has to leave the ammonia and combine with with lime; the ammonia becomes what is called "fixed" in the soil, and then it has to combine with oxygen and lime. A moist soil is required for these operations, and it would almost appear from our experiments as if an early spring application, although attended with more risk of loss by drainage, might be advisable. I was recently consulted by some farmers who were not satisfied by the increase of the late sown barley, to which salts of ammonia had been applied, and I advised them to apply the manure at the end of February, even when they did now sow the barley before April. If the crop had been corn or mangolds, which grow throughout the summer and autumn, I should have advised the application to take place when the seed was sown, but barley is a very short lived crop, and requires its food to be ready for use."

POTATOES AND POTATOES.

Recent issues of the London *Gardeners' Chronicle* contain notices of two plants that may prove of considerable and substantial interest to Nova Scotian farmers. The first is a New Species of Potato, *Solanum Ohrondii* found on the Island of Gorith in the mouth of the Rio de la Plata. The plant has been successfully cultivated at Brest and at Montreuil near Paris. It is perfectly hardy there and grows continuously, producing two crops in the year. It spreads like couch grass or artichokes, and M. Blanchard has found it impossible to root it out. The tubers are not larger than hazel nuts, but under cultivation they show a tendency to increase in size. The flavour is rather strong. The tubers of our now common potato, *Solanum tuberosum*, were probably