

a soil in which nearly every pebble is limestone, applies lime, but without the slightest beneficial effect, and straight way he condemns hook-farming as leading to such unprofitable expenditure. An inland farmer uses salt with advantage, and another on the sea coast where every sea wind salts his fields, tries it and finds it worse than useless. This want of consideration of circumstances vitiates a great part of the information contained in the correspondence of agricultural journals. A little scientific knowledge, such as an intelligent young farmer could easily obtain in a winter's course of lectures, would enable him to discriminate in such matters; but where he cannot do this, it is safest to follow such recommendations at first only on a small scale.

3. A mineral or other manure very useful at first, may ultimately become useless, or if too often resorted to, may even exhaust the land. In some American soils gypsum is very deficient, and that mineral manure was consequently found to produce very surprising results, chiefly because it supplied to crops sulphuric acid, a substance which they need and could not previously obtain in sufficient quantity. But, after a few applications, gypsum ceased to do good, and began to be cried down as a mere "stimulant." The truth was that for the time the land had enough of it, and just because it had enough required more of other manures. Precisely the same results have followed the application of lime in many parts of the world. The land over dosed with this one manure, became destitute of others equally necessary, and this all the more rapidly that lime had been applied, not only on account of the decomposing effect of lime on the manures in the soil, but from a more general cause, very easily explained. Let us suppose that any cultivated crop requires from the soil equal quantities of three substances, which we may call A, B and C, and that the soil of a field is capable of supplying in one year 1 A, 2 B, 3 C, the plant requiring equal quantities can only avail itself of 1 A, 1 B, 1 C, while 1 B and 2 C remain as surplus or go to waste. Let the farmer now apply annually 1 A to the field as manure, the plant now takes 2 A, 2 B, 2 C, and the crop may be doubled. But it is evident that the increased crop exhausts B and C more rapidly than the previous small crop. Hence perhaps in a few years the proportions in the soil are reversed, and it can yield only 1 B, and 2 A, and 2 C to the crops. The crop

will now fall to its originally small amount, and it is B that must be added to supply this new deficiency; any quantity of A doing no good when applied. This simple consideration explains many results otherwise puzzling, and we may add that the only manures which really contain the whole A B C of the food of plants, are those afforded by the liquid and solid products of the stable, and animal and vegetable substances of similar composition. Other manures are in their nature special and partial, and though their application achieves some of the greatest and most profitable triumphs of scientific agriculture, their misapplication through ignorance of the chemical composition of crops, soils, and manures, does very much to bring the whole scientific theory of agriculture into most undeserved contempt with practical men. It is hard that science should bear the blame of errors which arise simply from the want of it, yet this must be the case until farmers and agricultural writers familiarise themselves so far with the principles of chemistry as to be able to understand the meaning of the experiments which they make, and the results at which they arrive.

The bearing which we wish all this to have on the spring work, is to encourage experiments, especially with manures; but these experiments on a moderate scale and attended to in all their circumstances and results, so as to afford real information. We also wish to shew that the basis of all sound experiment of this kind must be the most careful economy of the manures produced from the crops which the soil has afforded, that nothing can in the present state of our knowledge make up for neglect of these, and that other manures, especially mineral manures, though capable of effecting surprising results, and even of rendering the most barren soils fertile; demand on the part of the farmer some scientific knowledge, and much practical good sense in order to realise their full benefits. Lastly, we beg leave to say, that we shall at all times be happy to answer to the best of our ability, questions relating to these subjects; our only fee for advice being payment of postage.

Root Crops.

It should be thoroughly understood, and the sooner the better, that in climates such as that of Canada, good and profitable farming can be maintained only by a rotation embracing in addition to the potatoe a large

proportion of other root crops, such as the turnip, carrot, mangold wurtzel, &c. Attention to such crops removes the necessity of fallowing, and both theory and experience shew that, in most cases, fallowing in this climate is a most wasteful process. By the culture of these crops, the soil is sufficiently exposed to the renovating influence of the air, manures are thoroughly incorporated with it, and brought into that state which is best suited to the nutrition of grain crops, and especially of wheat, and the increase of weeds is effectually checked. These are, however, small considerations in comparison with the value of the root crops themselves. By means of these, hay is economised, working cattle are more easily kept in good condition, cattle can be fattened in winter, and milch kine can be kept in a productive state throughout the season. In addition to all this, it is well ascertained that the manure produced by the cattle well fed on roots, is both more abundant and more valuable than that of cattle half starved on dry food alone. This as well as the necessity of attention to collecting other manures than those of the stable, and the promotion of a proper rotation in connection with these crops, renders them not only of great value in themselves, but the key-stone of all good tillage agriculture.

Root crops require time and labour, but these are well repaid, and even if their culture should require the farmer to restrict his labours to a smaller surface; he will find more profit in cultivating a small farm with their aid than a larger farm without them. Some of them have also the reputation of being uncertain; but it can, we think, be shown that even those green crops considered the most precarious, can, by proper means be rendered certain.

We invite the earnest attention of all agriculturists to this subject, and in order to contribute our mite toward the extension of the culture of root crops in the present summer, we propose to give a series of articles on the best methods of culture approved by experience in this and similar climates, and we shall endeavour to insert these just as the season arrives for attending to the different operations to which our articles will relate.

In the present article, we shall direct attention to the most profitable root crops, their best varieties, and the methods of manuring and sowing, and in doing so, we shall avail ourselves largely of the informa-