anything. In woodland districts in England we used to put "caps" on the sheeps' heads, but before the fly begins its attacks, not after a sheep has been stung.

As for the "scab", as long as sheep are allowed to get so wild that they jump any fence in the country, so long will this contagious disease be ineradicable. Lawes' sheep-dip, after shearing will do much good to those infested with ticks, &.

ARTIFICIAL MANURES AND THEIR USES.

By J. W KNIGHT

(First prize—Exhibition of 1895.)

Plant-food—Nitrate of soda—Sulph. ammonia—Phosphates and super phosphates—Potash—Application—Effects of various manures on mangels, &c.

A great many elements are essential to the growth of plants, but the majority of these are present in most soils in sufficient quantities to ensure fair growth. We will consider fertilizers which supply the three most important elements, namely: Nitrogen, Phosphoric Acid and Potash, as they are the best known and universally used.

Probably the most used of all artificial manures is Nitrate of Soda, or Sodium Nitrate. Enormous deposits of the crude salt are found in Peru. Before being fit for use it is necessary to purify it, this is done by crystallization, common salt being the usual impurity. This manure is valuable solely for its nitrogen, it is an excellent manure for all cereals, roots and forcing crops. Its effects are especially noted in dry seasons, this feature gives it an advantage over other commercial fertilizers. It is well adapted for clay soils; the soda which it contains and leaves in the soil apparently helps to render the potash and phosphoric acid in the soil available to crops. It is very soluble and therefore very quick in its action, and should not be applied in very large quantities. (1) On account of its solubility it is liable to leach out of a reach of the plants before they have time to assimilate it. (Therefore, keep it atop.—Ed.)

Sulphate of Ammonia is another manure which is valuable for its nitrogen only. It is prepared from the ammoniacal products of gas works principally. It is highly important that it is free from all impurities before being applied. It is a powerful manure for corn crops. The ammonia is converted into nitrates in a few days or weeks after an application of the salt to a moist soil. It is well to remember that this manure produces little effect on soils destitute of lime, and should be employed only, on soils of a calcareous nature. (1)

Bones, when finely ground up are a good manure, they decompose very slowly in the soil, especially on heavy land; their effect is thus spread over several years, the finer the bones have been ground the more immediate is their effect. They are valuable for their nitrogen and phosphoric acid and are a good manure for turnips.

GROUND PHOSPHATES.—Most phosphates (2) when finely ground may be succesfully employed as manure without being converted into superphosphates. They are valuable in Germany and Great Britain. The soils most suitable for such manures are those rich in humus or vegetable mould and deficient in lime. They are especially effective as a manure for turnips

SUPERPHOSPHATE.—This manure is prepared from the mineral phosphates which occur in nature by treating them with sulphuric acid, but space will not admit of our going in the chemistry of the preparation. As in other artificial manures it is essential that it be free from all impurities and its value depends on the percentage of soluble phosphoric acid present. Superphosphates form the basis of almost all manufactured manures. Mixed with Nitrate of Soda, it is an excellent manure for cereal crops, especially corn, but care must be taken in mixing, which should be done just before applying, or the superphosphate may be sown with the crop and the nitrate of soda applied afterwards as a top dressing. (3) It is also a splendid manure for cereals when mixed with Sulphate of Ammonia. Superphosphate is chiefly employed for turnips, for which it is invaluable. Turnips have not the power of assimilating the natural phosphates which are in the soil to any extent; thus the advisibility of applying this fertilizer. When Superphosphate is applied to cereal crops it hastens maturity. (1)

Gypsum or land Plaster is a splendid manure for such crops as clover and all other leguminous plants. It should be sown on the surface of the soil. If sprinkled on the tops of young turnip plants it is effective in checking the ravages of the flea beetle, (1) and its action as a fertilizer soon pushes the plants past all danger of them.

Slaked or Quick Lime has a very powerful action on soil containing vegetable matter, but it should be used with discrimination lest the humus of the soil be unduly diminished. (1) Heavy clays are also benefited by applications of lime is to render available the plant-food already in the soil without supplying any significant amount itself. Liming therefore cannot be succesfully repeated except at consilerable intervals. (good.)

POTASSIUM SALTS.—These are obtained from Germany and are valuable for their potash. Wood ashes, unleached, are also valuable as a potash manure. and should never be sold off the farm. We find ash-carts going through our country collecting ashes, and farmers actually giving away bushels of this valuable fertilizer for a few paltry bars of soap. Such practices should be discontinued. Potash manures produce their greatest effect on pastures, clover, potatoes and root crops. Clay soils are naturally furnished with potash and are not much benefited by such manuring. (Capital.—Ed.)

COMMON SALT OR SODIUM CHLORIDE, supplies no essential element of plant food. The value which it possesses is probably due to its action in the soil where it may help to set free more important elements. It is commonly used for mixing with nitrate of soda as a fertilizer for mangels.

A word may be stated as to the application of the manures, which are all readily soluble. A manure can be only beneficial when its constituents are brought into immediate contact with the roots of the crop. To attain this contact to the fullest extent, the manure must be thoroughly and evenly distributed throughout the depth of soil mainly occupied by the roots. Soluble manures, such as we have been considering have the faculty of distributing themselves within the soil after the first heavy shower far more perfectly than can be done by any method of sowing. When manure is especially required by the plant in its earliest stages, as superphosphate for turnips, it may be drilled in with the seed, but as a rule it should be sown broad cast and ploughed or harrowed in. Nearly all artificial fertilizers should be applied in the Spring, (good) and their effect is principally noted the first season after sowing. The amount of each of these manures which should be applied to an acre varies with the nature of the soil, the crop, the season, and the quality of the manure. Therefore this point must be decided by the farmer himself after carefully experimenting.

All commercial fertilizers should be purchased only on analysis; this is highly important and should be kept in mind when corresponding with dealers with intention of purchasing.

In conclusion we might state that the true economy of artificial manures can be understood only when we are acquainted with the special characters of the crops we cultivate. The composition of a crop is no sufficient guide to the character of the manure appropriate to it, even when we possess in addition the composition of the soil on which it is to be grown. It is not only the materials required to form a crop, but the power of the crop to assimilate these materials, which must form the basis of our judgment. (Very good indeed —Ed.

When land is in a fertile condition the total amount of plant available is very considerable, and luxuriant growth may be obtained by supplementing the stores of the soil with the few particular elements of plant food, which the crop it is wished to grow has most difficulty in obtaining.(1)Thus, in a large majority of cases, a dressing of Sodium Nitrate and Phosphates will ensure a full crop of wheat, barley or oats, and in many cases Sodium Nitrate alone will prove very effective. These cereal crops generally find the supply of nitrates in the soil insufficient for their full growth and the supply of phosphates more or less lacking. But in the majority of cases they are well able to obtain a sufficient supply of potash and other essential elements of plant food. We are thus able by supplying one or two constituents of the crop, to obtain a luxuriant harvest. In the same way, Nitrate of Soda, employed alone, will, in most cases, prouce a large crop of, mangels; superphosphate alone, a large crop of turnips; while potash alone may be very effective with pastures and clovers. As the whole object of artificial manuring is to supplement the deficiencies of the soil in available plant-food, it is important that a farmer should ascertain by experiment just in what element or elements of plant-food his soil is deficient. And on this will depend the economy with which he is able to use purchased manures, which are too often wastefully employed. (Very good indeed—The only prize accorded to "Essays on Artificial manures", was lecreed to this article.—Ed.)

(1) Should be applied at twice.—Ed.

(1) There is enough lime "for the purpose" in 9-10 of all soils used for farming.—Ed.

(2) Except our "apatite."—Ed.

(3) The latter is by for the better way.—Ed.

(1) And nitrogen just the revise.—Ed.

(1) Any dust—road-dust for instance. does just as well.—Ed.

(1) Not much fear of too much lime being used here. We hear known of 200 bushels being applied to the acre, and no harm resulted.—Ed.

(1) Excellent sense.—Ed.

PLOUGHING AND SUBSOIL PLOUGHING.

Ploughing-matches—Covering the sod—Feering—Water-furrows—Subsoil-ploughing—Drilling up land for roots—Learning to drive-plough.

There are indications that farmers in general are becoming more alive to the importance of good ploughing; its beneficial effects being apparent wherever comparisons can be made. There are many however in every part of the province who are decidedly careless about that part of their farming operations. But good ploughing can only be done by good ploughmen, and to be a good ploughman requires as much training and application on his part as would have made him a first class mechanic, or a professor in a college. The theory of it may be put on paper, but the training of the eye to measure size of furrow, to the fraction of an inch, the ready and spontaneous use of the hand to act in harmony with the eye, the training of the horses to answer a slight pull on the rein and go as wanted; with freedom of head from tight reining or tying back, are only acquired by persistent practice. These small details may seem unnecessary, but observation has convinced me that it is a part very much neglected, perhaps the best way of stimulating a spirit of emulation in the art of ploughing among our young men would be to have more annual ploughing matches, say in every parish; it might induce a spirit of friendly rivalry among them and bring more of them out as competitors.

The winning of prizes would be a small part of the benefit to them of these matches as the training necessary to excel in the art of ploughing would be likely to foster habits of tidiness and neatness in all their other work. The plough; that is, it has wooden handles, in this province at least, is the wooden plough that is, it has wooden handles, iron beam, steel mould board, and cast metal sock, the latter is cast aside and replaced by a new one when the point becomes worn, so as to lose its grip on the ground, this is often delayed from mistaken ideas of economy, till ploughing merges into grubbing or something of that sort. I may remark here that nearly all the ploughs in use at the present time, except those made expressly for sod, are very plain, a little higher cut would be better, either for stubble or potato-land, as there would be more shoulder on the furrow, more surface exposed to the action of the frost, and the harrows, would do better work on it in spring. I will now try to describle how ploughing should be done, and as there is some difference in the way of ploughing stubbles, potato-land, and sod, each will be treated separately. Beginning with sod, a high cutting plough is the best, as besides exposing more surface, the sod or grass can be all firmly covered, and thus will all rot. The crop next season will not be part timothy and part oats &c. If the ridge before ploughing is of good shape and the furrow of medium depth, about the same size of furrow can be maintained in ploughing most of the ridge. If the ridges are badly shaped, as from having high crowns, flanked sides and deep furrows (common faults) or sometimes the furrows are so shallow as to be hardly perceptible, but whatever the shape of the ridge or depth of furrow, the aim of the ploughman should be to leave his ridges when ploughed,