

One word of caution to experimenters.— Don't run the thing into the ground! The Sorghum will prove a valuable addition to our crops, if we don't render it odious by some Multicaulis foolery. But wheat, Indian corn and clover are not going out of fashion for some years yet.

CENTRAL HORTICULTURAL AND AGRICULTURAL CLUBS.

TURNIP AND OTHER ROOT CULTURE.

At a meeting of this Club on Thursday last, Captain Berestord, of Newmarket, read the following paper on the Cultivation of Roots:

The use of roots was as well known to the ancient Romans as to any British farmer, and the winter-feeding of cattle with roots was practised even among the ancient Gauls.—Pliny remarks that "some Roman authors have treated of Rapa in only a cursory way. The Greeks more particularly, but if a just order were observed, it should be mentioned immediately after wheat, or at least after the bean: for no other plant is so well adapted for food to all sorts of animals." But though the cultivation of the turnip was known to the ancients it has been left to the British husbandman to make manifest its importance, and in the words of an English writer, "Turnip husbandry greatly aided the transition from the barbarous agricultural usages of the middle ages to the enlightened ones of the present day; and is now well known to every good farmer to be the sheet anchor, or *sine qua non* of the modern alternate and convertible husbandry." At what time the field cultivation of Turnips was begun in Britain, is not, I believe exactly known. They were employed for domestic purposes at an early date. The field cultivation seems to have been introduced from Flanders, and to have taken special root in Norfolk. Wortidge, in his "Mysteries of Husbandry," printed in 1669, says:—"In Holland, they slice their Turnips with their tops, and rape-seed cakes and grains, and therewith make mash for the cows, and give it to them warm, which the cows eat like hogs." And he complains of the great neglect of all similar use of turnips in the former economy of England. The usual mode of sowing turnips both in Flanders and in Norfolk was broad-cast, and continued so for many years, until the introduction of the drill system: and the benefit which that system confers in respect to quantity of produce and economy of labour, together with the facility it affords to hand hoeing and horse hoeing, and the land thereby being cleaned and fertilized by the important crop, cannot be too fully appreciated. Under due management it may be considered that almost all kinds of soils which are capable of thorough tillage may be cropped by some kind of root, either turnip, parsnip, carrot, or mangel-wurzel; in Britain the practice is to fall-plough the land intended for roots, in this country the earlier in the fall this operation is performed the better, to allow time for the grass seeds to decompose, and as early in the spring as the season will permit, the land should be ploughed again and well worked with the harrow and cultivator. With regard to the question of the most efficient system of manuring land for a root crop, an inquiry into it is so vast, and contains within such abundant matter for discussion, that I shall not enter into it—we should have to take into account that which is best adapted to promote rapid and early growth, to assist the plant to escape destruction from insect depredation, the effect upon the development of the root, the influence over the chemical constitution of the root, both with regard to the general feeding and fattening powers on the live stock, and lastly to its adaptation to the uses of the succeeding crops in the rotation—in it is contained almost the entire science of agricultural chemistry: still without entering upon it, this much, I believe, is recognized, that well rotted dung is essentially necessary to the culture of the turnip, where it is used at all. The turnip is the most important root cultivated: and whatever relates to it may be applied to the culture of mangel-wurzel, carrots, etc., and as barn-yard manure

is generally employed in this country, I will direct my remarks to be made of cultivation under which I have seen raised larger crops of these roots, where farm-yard manure is used, the raised drill or ridge, is not, I probably, the best, the ridges are made either with a single cast of the double mould, or with a double one of a common plough, a cart, or a manure follower, the length of the ridges is 20 or 25 feet, the distance between the ridges is 4 or 5 feet, and the drill succeeds. A light roller goes over the sown ridges to cover the seeds. The distance between the drills should not be less than 27 inches. Tall appears to have used intervals of three feet. Mr Dawson, of Roxburghshire, after some residence in the county of Norfolk, adopted the drill system in preference to the mode which he had seen practised in that County. Mr Dawson began the drilled turnip husbandry in 1764, growing nearly 100 bushels yearly; he fixed upon thirty inches as the best interval for the purpose, and his practice has been followed in all the border counties. Sevens remarks, "It is not an unusual practice in England to sow turnips broadcast in the flat ground, instead of in drills, and the reason I have heard stated in vindication of the broadcast method is, that it resisted the bad effects of drought, but, for my part, I cannot see how a broadcast crop can screen the ground from drought more effectually than one in rows, since the plants have to grow and be thinned out to proper distances, and the ground stirred to get rid of the weeds, in both cases, and as the weeding is done by hand instruments in the case of the broadcast crop, it is not so effectually done, and I may include so economically done, as with horse hoes in the crop in rows. And I think it cannot admit of doubt that the same quantity of manure placed immediately under the seed should promote the growth of the young plant more rapidly than when spread over a large surface of ground." I trust we shall have some remarks by some of the gentlemen present on this point, also with regard to preparing the land in the fall. The after culture of the turnip crop consists in thinning or singling the plants to the proper distances, and in a series of operations for destroying weeds and stirring the soil. The first is generally done by a horse hoe when the plants have acquired the rough leaf, or are about two inches high. A few days after this operation the hand hoes go to work, and so hoe the turnip plants as to leave them standing singly at the distance from each other of not less than 12 inches between the plants of Swedish turnips and 9 inches between those of the white. This operation of singling is most important, much must be left to the judgement of the farmer. To show how important careful attention to this point is required, it has been shown that the effect of one or two inches between the turnips has influenced the weight of a crop by several tons per acre. It is a delicate operation and requires the superintendance of the master and the hand of a skilful laborer. The raising of stock in this country is an important and interesting question: is sufficient attention directed to this important point? It was likewise a difficult task in Britain to support live stock through the winter months, and the practice of feeding cattle and sheep for market was hardly ever attempted until turnip husbandry commenced.—The Canadian farmer experiences the same difficult task; and why, because he affords his stock nothing but dry food. How many cattle are there in this country who, from the time the snow falls on the ground, in December, until the month of April, never partake of any vegetable food? Is it possible to maintain the milk cows and other stock in a healthy condition, without a portion of roots with their dry food? I heard a gentleman, and agriculturist, not however, a Canadian, say at a public meeting held during the time of the Provincial Exhibition at London, "that turnips were a nasty cold food,—that he was surprised to see the farmers of Canada grow them." In Mr Hall Maxwell's report from the Highland Society of Scotland presented to the Commissioners of Pray Council for Trade. He reports, that the average under crops was, in 1856, 2,345 7/8 bushels of wheat, 500,000, turnips, 400, 711, acres, what

was the produce of 1000 bolls of Scotch wheat? What was the same system wrought in England? England by her almost insurmountable area in green crops, maintains the fertility of her soil, and according to the Journal of the Royal Agricultural Society produces four times as much wheat per acre than France, yet the climate of England is not particularly adapted for growing wheat. In the United Kingdom there are 20,000,000 sheep, France has only an equal number, and a French sheep is only half the size of an English sheep. I confess I viewed these facts as showing the importance of root cultivation. The soil is cultivated, an abundance of food is provided for man and beast, the fertility of the soils is maintained, the land is cleaned by the preparatory crop, and a bed is provided for grass seeds, in which they grow and thrive with greater vigor than after any other mode of preparation. There are many persons here present who saw the Toronto Christmas Market. Was it a show of Canadian beef? The Canadian farmer appears to be giving up raising stock—arising from his neglecting his root crop. I have stated that in England, by attention to green crops and raising cattle, four times as much wheat per acre is raised than in France. We import beef, so we may have to import our wheat. Every Canadian farmer could, with perfect ease, devote every year a portion of his land to roots; five acres, at least, to every hundred in cultivation; by so doing, he will be able to maintain more stock, obtain more manure, and produce more wheat per acre, than under the present system. The nutritive matter contained in an acre of turnips is great, in a crop of 20 tons, or 45,000 lbs, there were 2500 lbs of thick or woody fibre, 3000 lbs of starch, sugar, gum, 670 lbs of gluten, 130 lbs of fat or oil, and 300 lbs of saline matter—total 9,000 lbs. A crop of 25 tons, or 56,000 lbs per acre of carrots, contains 1,880 lbs husk, or woody fibre, 5,000 lbs sugar, 840 lbs gluten, 200 lbs of fat, and 800 lbs of saline matter—total, 9,120 lbs. The quantity of nutritive matter afforded by a crop of mangel wurzel of 20 tons, or 45,000 per acre, consists of 900 lbs of husk or woody fibre, 4,950 lbs of starch, sugar, etc., 900 lbs gluten, 450 lbs saline matter—total, 9,120 lbs. From a crop of oats, at 50 bushels per acre—the 50 bushels weighing 290 lbs—we obtain 420 lbs of husk or woody fibre, 1,070 lbs starch, 300 lbs gluten, 100 lbs of oil, and 80 lbs of saline matter—total 1,870 lbs. A heavy crop of wheat, at 60 lbs to the bushel, the weight of grain per acre would be 2,500 lbs. The amount of nutritive matter from an acre of Indian corn, at 30 bushels, amounts to 1,700 lbs. From an acre of peas, at 25 bushels per acre, 1,702 lbs. We have, therefore, 1000 lbs of nutritive matter from an acre of turnips, 3,120 lbs from an acre of carrots, 7,200 lbs from an acre of wurzel, 1870 lbs from an acre of oats, 1,700 lbs from an acre of Indian corn, 1,302 lbs from an acre of peas, an acre of good turnips is calculated in Scotland to keep four oxen, would an acre of wheat or oats, or Indian corn maintain that number? I am indebted to Stephens for these calculations, taken from Johnston's Lectures on Agricultural Chemistry.

The use of carrots on a farm is well known to those who cultivate them. The seed should be sown early in the spring—the land having been well worked, for the carrot delights in depth and openness of soil. The grand use of carrots on a farm is for strengthening and medicinal food to horses and cattle. A gentleman of my acquaintance was very successful in giving them last spring to his horses, when they were recovering slowly from the influenza. They greatly promote the health of all animals. The difficulty attending the sowing of the seed of the carrot operates against any large breadth of land being devoted to its culture. They should occupy, however, some space in every root field of the farmer. The long red mangel wurzel, the globe orange and the red carrot roots are eminently suited for culture in this country.—They are suited to a much greater diversity of soils than the turnip. On peaty soils on the reclaimed bog lands of Ireland, they have produced a large amount of food, equally a cleansing one with the turnip. The mangel stows as well, and better, as excellent spring