that should have been done, or some error in the arrangements for the slimly attended meeting has crept in, barring such casualties as weather and other things that are beyond control, for as the Gauls when they invaded Italy and tasted of the wines thereof wanted more, so the farmer when he is given one good feast is likely to come back for another.

It seems not a little strange that farmers should show any indifference as to the success of meetings intended expressly for their benefit, but in this we see nothing more than an outcrop of human nature. The world over mankind are indifferent to their highest interests, and to remove this indifference is the lifework of the noblest army on the earth ; and it succeeds not simply by spreading the feast before the multitude but by going out, as it were, gathering them up and compelling them to come in. True, men are less indifferent to material things, but this indifference manifests itself in various ways. The boy refuses to gain that knowledge in early life which will help him on to success, and there is much of the foolishness of boyhood clinging to most of us to the end. That farmers should play shy of attending meetings that are wholly new to them is not so strange after all, and following in the wake of the missionary, by using every device that is lawful and reasonable to persuade them to attend, we should try and bring them in. The most effective means to secure this attendance is the loyalty of those who are members. A church with fifty members whose hearts are aflame with love to mankind, will transform a neighborhood more quickly from the wilderness to the garden condition than one with five hundred wearing the garments of a formalistic faith. An invitation from the secretary by printed postal card and intimations by small posters circulated through the schools, will accomplish much, and in certain localities intimations through the press.

But it is said that some remain aloof who look upon the Institutes as a political engine to strengthen the party who are at present in power, and we are obliged, reluctantly, to believe it true. So far as our own observation goes, and it concurs with the testimony of others, a large majority of those who attend the Institutes belong to one political party. Now, to say that the Institutes have no connection with the Government is not correct. They are the creation of the Government ; but who will be so unfair as to say that they were not called into being for the advancement of the farmers' interests rather than to strengthen the Government? It is a conclusion supremely foolish to refuse to participate in the advantages of any public benefit because it happens to be popular with the people and so may indirectly tend to strengthen the Government. On this principle the farmers of the North-West, not in sympathy with the Government, might as well refuse to sow the Russian wheat brought in through the Experimental Farm at Ottawa, or to grow the hardy fruits tested at that admirably conducted institution. If Farmers' Institutes prove a means of lifting up the farmer, those who refuse to attend them will not be lifted up, and they will have no reason to complain if their neighbors beat them in the race. We can have every patience with those who refuse to attend the Institutes through indifference, but none whatever with those who refuse to attend them for political reasons. While the advantages that flow from party government are very great, it is a matter of inexpressible regret that because of this men will deprive themselves and their families of a knowledge in reference to their calling, the influence of which can only be helpful.

Essay on Field Roots—their Comparative Value as Cattle Food, Cultivation, etc., etc.

BY D. NICOL, CATARAQUI, ONT.

To which was awarded First Prize by the Ontario Agricultural and Arts Association, 1888. (Concluded.)

Of Soils .- The soils best suited for the cultivation of the turnip are unquestionably those of a free-working loamy character, in which the most suitable, conditions, chemical as well as mechanical, for the growth of the plant are to be met with. In the lightest de-scription of soils, those proceeding from silicious beds of the several sandstone formations, the mechanical conditions, so far as the particles is concerned, is to be met with to the greatest extent; and in the heaviest descriptions of soils, those proceeding from the clay beds of the argillacious formations, the chemical conditions exist in the most favorable proportions. Between those two extremes we have a wide range of soils, possessing in necessarily varying proportions the two desired conditions. To assign to these their proper relative values in the cultivation of the crops would be impossible without a knowledge of the climatical conditions of the district in which it was to be carried on ; as in a locality where the rainfall is great or humidity of the air constant, the mechanical texture of the soil would be of higher relative importance than its chemical constituents, whereas, in naturally dry districts, a far larger proportion of clay moisture, improve the texture and capabilities of the turnip soils. would, from its powers of absorbing and retaining

There is no doubt that, within the last few years, the range of turnip soils has been greatly increased in this country by the aid of thorough draining and the mechanical contrivances which our skilful and enter prizing agricultural engineers and implement-makers have piaced at our command. These soils, however, possessing in themselves the natural suitabilities of the crop are always the most free from disturbing effects of weather, etc., economical to work and most suitable in their returns. The essentials of a turnip soil are that it be deep, free from stagmant water, susceptible of minute division, and sufficiently tenacious to absorb and retain moisture sufficient for the wants of the plant, and that its general composition be such as to contain the mineral constituents necessary, for its growth. The plant being a quick grower is, of necessity a

The plant being a quick grower is, of necessity a rank feeder; therefore, the first essential is depth of soil. In some cases this is limited by natural causes in many, however, it can be materially increased by under-draining and judicious sub-soiling. It is necessary that the soil should be deep enough to allow the branching rootlets full range in search of food; that it should be in mellow condition, so as to present the largest possible amount of surface to the fertilizing action of the air and moisture always in contact with it, and thus add at once to the feeding surface and food materials of the plant.

The difference that we so frequently see in the turnip crops in the same districts, where the same climatic influences and insect visitations occur, are generally attributable to the more or less perfect observances of these necessary conditions. They are simple in themselves, involving no great difficulties in their comprehension or execution. If it is good policy to grow turnips at all, it is surely the best policy to take every advantage of circumstances which will enable us to do so with the greatest chances of success, and thus produce the largest and most remunerative returns.

For the best system of rotation the turnip crop is placed between two straw crops. It is essentially a fallowing and manuring crop, its thorough cultivation being an effectual method of checking weed growth and keeping land clean. Its requirements from the soil differ materially from those of the straw crops, while from the nature and habits of the crop itself, it abstracts from the atmosphere a large amount of those nitrogenized substances which we have reason to believe are so beneficially applied to the growth of the succeeding cereal plants.

succeeding cereal plants. The principles that should govern the application of manures are still very imperfectly understood by us, and until agricultural education is more advanced, and the farmer is better acquainted with the nature of the plants he cultivates, and of the soils and atmosphere in which they grow, there will always be diffi-

culties in the way of establishing anything like general intelligible rules for our guidance. Chemistry, however, has done this much which we can practically apply with advantage : it has made us acquainted with the nature and amount of ingrepients which our different growing crops abstract from the soil, and we may, therefore, fairly infer that, if these are again re-turned to the soil in the shape of manures, we shall at all events sustain its normal degree of fertility. This probably, for the present, is the safest and simplest guide we can take in deciding upon the description and quantity of manure we should apply to our fields. The calculations are easily made by those who prefer accurate figures to guess work in their es-timates, and if the quantities given to the land are in excess of the quantities abstracted from it the land will certainly be kept in good condition. Of all mineral substances abstracted from the land by growing crops, potash and phosphoric acid are the most important, while in most soils they are met with in but very small proportions. Looking at the analysis of the turnip, we see that the proportion of potash it ab-stracts from the soil is about three times that of phosphoric acid ; therefore, in the use of all attificial man-ures, we should endeavor to secure due proportions of these ingredients. It is now generally known that farm-yard manure contains within itself all the substances which plants require as food, and in about the right proportions. Not only does good, well-cared-for farm-yard manure contain all the inorganic (mineral) substances the crop requires, but also the organic substances which are equally essential to its growth, but which usually, to a great extent, obtain from the atmosphere.

When a turnip crop succeeds a grain crop, it is important that preparation be commenced immediately after the field is cleared of grain by inducing as far as possible the germination of weed seeds in the fall.

The gang-plough is well suited for this purpose, covering the seeds sufficiently to induce them to start as soon as they absorb moisture ; then, just as soon as the seeds have started, a going over with the harrow puts an end to that crop, and brings to the surface most of the roots of the perennial weeds which, by a few days' exposure to the hot, drying sun, are ready to be ploughed under again. This is the proper time for the fall application of whatever farm-yard manure may be available for the purpose. It should be spread evenly and finely pulverized with the harrow before being ploughed in for the winter. Manure ploughed under in the fall becomes more thoroughly incorporated with the soil, thus making a more congenial seed bed in spring than fresh manure as fine a tilth as possible, it is always a visable to cross-plough the land in spring, and this should be done before drilling for the seed, as it gives another chance for weed seeds to start and be destroyed by the harrowing before the drills are made. When bone dust or any other kind of artificial manure is to be applied, it should be sown broadcast on the land just at this time, as in making the drills it is mixed with the soil.

The distance of drills apart should be thirty inches, although some think less sufficient, but in the Lothians and other well-farmed districts in Britain drills are generally made thirty inches apart, so as to allow ample room for the growth of the plants, and for the use of the horse-hoe in keeping the ground clean

One great secret of success in growing turnips is to sow only when the ground is in moist condition, and just immediately after the drills are formed, so that the seed springs and gets somewhat advanced before the skipping-beetle (black fly) can come on in strong force; otherwise, if the seed is sown in dry soil it will not germicate until there comes a shower of rain, which may be many days thereafter, and by that time the enemy has gained the vantage ground. So that not a plant is allowed to appear above ground. Hence it is always better to wait a few days until the necessary conditions can be secured. The best time for sowing the Swede here is from the 1st to the 25th June. Many seem to think that by deferring until later they are more likely to escape the ravages of the destructive insect, but not one-half so much depends on that as on taking advantage of his position.

[&]quot;We think the last number the best issued and hope the farmers and breeders of Canada appreciate your efforts to give them one of the best journals in their interests on the continent."-Sharman & Sharman, Souris, Man.