

the first importance to maintain the soil always in a loose and friable state, for the twofold purpose of allowing the admission of the atmospheric air, which it is now well known exerts a most beneficial influence on the growth of plants, and of enabling the minute fibres of the turnip to extend themselves in every direction in quest of nourishment.

NOTES ON MANURES.

Why do our crops require manure? is a question which is frequently asked by those who direct their thoughts to agricultural subjects; the weed springs up on the way side, the flower blooms on the banks of the mountain stream, and innumerable plants, with rich foliage and delicious fruits, come to perfection "far away" in the lone desert, where the foot, even of the hunter, has seldom been, and where no man watches over them. I remember a writer, in an agricultural journal, at one time asserting, that a handful of seeds, scattered abroad over the fields, would all come to perfection; but though the wild plant springs up seemingly by chance, its growth is regulated by laws as fixed and unchangeable as those which produce the revolutions of the seasons, or the alternations of day and night. Every plant which the Almighty has spread upon the face of this beautiful earth, to delight us with its appearance, to afford us food or clothing, depends for its existence upon certain conditions. The saltwort flourishes only on our sea coasts, because only there the matters essential to their growth abound; while the red broom-rape (*Orobancha rubra*) springs up in the soils formed by the weathering of the basaltic rocks of Antrim, rich in the substances required for its support. But it is too absurd to suppose, that seeds would arrive at their perfect development in any kind of soil; the experience of centuries teaches otherwise, and science explains the reason.

The seed which we place in the ground "is not quickened, except it die;" it must undergo decomposition to prepare it for the production of the new plant. In the tiny seed of the wheat, changes, so complicated as to fill the profoundest philosophers with astonishment, precede its bursting into leaf. For the continuance of its existence, the young plant must meet in the soil, within the reach of its delicate fibres sent out to collect its food, a store of earths, of alkalies, and metals, properly prepared for its nourishment; some of them required to give solidity to its stem, others to construct the delicate net-work of its leaves, and others, again, to develop its seed; and all these building materials—the wood, the stone, and the iron—must be there, and in proper quantity, or the edifice cannot be erected, the plant will be unable to form that stately stalk, and weighty head of grain, which gladdens the heart of the farmer, and repays his toil. In some situations all the materials for building up the wheat plant do not exist, and there,

though it may grow for a time, it cannot come to perfection, in other localities, again, all the materials may be present, but, in limited amount, only capable of yielding a poor and starved looking crop, barely sufficient to cover the expenses of the tillage.

The plants which we have selected to supply us with food are not natives of this country; and, in their wild state, most of them are worthless weeds. When we compare them with plants of the same species, cultivated in our farms, we find that they contain a comparatively small amount of those peculiar forms of vegetable matter, which render our cultivated plants so valuable to us for food, for the production of food. The quantity of mineral matters which plants in their wild state require from the soil, for the continuance of their existence, is exceedingly minute, and, besides, the wild plants are not carried away every harvest, like the crops raised in our fields, but die, and restore again to the soil the substances which they had taken from it, so that in the following season it is capable of again supplying their seeds with the alkalies, and other materials required for their growth; and thus, like what was imagined of the fabulous bird of the ancients, they spring up from their own ashes.—Transported, however, into the farms of the European husbandman, and placed in situations containing a larger supply of the matters which contribute to their development than was accessible to them in their natural state, they have attained a size and value entirely different from what they originally possessed. It is to maintain this abnormal development of all their parts, that the skill and labour of the farmer are unceasingly required; and when we know that, with every ten tons of potatoes that we carry to the market or consume for food, we are removing from our fields 113 lbs. of the alkaline matters, upon the presence of which in the soil the potato plant depends for its full development, and that every acre of turnips sold to the cattle feeder robs our farm of 154 lbs. of the same substances, we can easily conceive that even the richest soil in the kingdom must, in the course of a few years, be deprived of a large amount of its nutritious matters, and become incapable of supplying them in sufficient quantity for the production of crops valuable for food or commercial purposes. Were the farmer to leave his potatoes or turnips to Nature's care, they would return again to their natural state, and lose their value as articles of food. He must, therefore, supply his farm with the alkalies, the phosphates, and other matters carried away in his crops to market.—Observation has taught the farmer that by covering his fields with what is termed manures, he can increase the value of his crop manifold; experience has also taught him, that a field which has lost its fertility can again be rendered productive by covering it with the excrements of animals, and that the amount of crop produced

will be in proportion to the supply of manures. For centuries he has applied these substances without the slightest knowledge of their operation; indeed, until within these few years, agricultural science was not sufficiently advanced to give him much assistance in such inquiries. But we are now in a new position; the conditions which influence the growth of plants have been carefully investigated; the balance, that unerring test, has been applied to these important questions; and a flood of light has been cast upon what was formerly, even to the philosopher, but "a palpable obscure." I do not pretend to say that we, as yet, enjoy a clear day-light view of this subject in all its parts. Agricultural chemistry is a new science, and, on many points, those labouring to advance it hold conflicting opinions, but the researches of Liebig and Boussingault, of Sprengel and Johnston, have already given us much, that we can lay firm hold upon, and which is of great value to the practical agriculturist.—John T. Hodges, M.D., in *Northern Whig*.

A SURE CURE FOR THE BOTS.

Messrs. Editors:—In your paper of May 16th, I noticed an enquiry for a cure for the bots in horses. Here it is, as simple and as cheap as any one can ask:—One ounce of copperas, pounded and put into a junk bottle, with 12 pint of warm water; shake it until it is dissolved, pour it down the horse's throat, and the horse will be well in two minutes.

I have used this medicine more than thirty years; I have given it and ordered it given to more than one hundred horses, and never have known but one case but what it cured immediately; then it was not given until the third day after the bots got their hold; it was then too late, they had eaten through. A horse that is apt to be troubled with bots should be fed half a spoonful of fine copperas, in his feed, once in two or three weeks; every man that keeps a horse should keep copperas on hand.—*Boston Cultivator*.

ON THE CHEMISTRY OF VEGETATION.

BY DR. MUSPRATT.

A series of communications containing analyses of the ashes of plants and manures, and other useful information connected with the tillage of the earth, have been so long required, and are so essentially of service at the present time, when artificial fertilizers are coming into vogue, that, at the suggestion of numerous friends I undertook to amass all the information in my power, and now place it before the agriculturists, with the view of affording them an insight into the economy of the vegetable world. There can be little doubt that, in a few years, all the recrements of the farm-yard will be carefully collected and applied to the fields, and as science advances the results of the field produce will be conducted with as much surety as those of the laboratory, and will