

ON SOILS.

Sin.—To give a clear idea of the chemical relation of the soil to the plants which grow upon it, it is necessary to consider, that the outermost covering of the globe reduced to a rough powder by any means whatsoever, is termed soil, and must, on account of its origin, partake much of the nature of the under-strata termed subsoil, and for facility of consideration, may be divided.

I., A base, which forms the principal substance of the soil—about 96 or 97 parts of the 100, and is composed, 1st, of alumina and Silica (clay and sand), in very varying proportions, making all the varieties of soil from stiff clay to loose sand; 2nd, of carbonate of lime, making the limestone land; 3rd of carbon, with small portions of silica or sand, as in peatsoil. All the three kinds of bases contain larger or smaller quantities of each other, making so many varieties of soil. This base serves to hold the plants by its root in the most favourable position for receiving the benefit of the atmosphere by its leaves performing the office of respiration. It also serves in the best manner possible for the ramification of the roots, and holding fast the plant. It also acts as a diluent and distributor of the more active inorganic constituents.

II., The fertilizing particles which form 2, 3, or 4 parts in the 100 of the soil, and consist of a number of substances greater than are contained in the base though so much less by weight; they are potassa, soda, magnesia, lime, silica (sand,) alumina (clay,) and iron in combination with sulphur making sulphuric acid and sulphates, phosphorus making phosphoric acid and phosphates, chlorine making muriatic acid and muriates, and carbon making carbonic acid and carbonates, and are the ashes left after burning vegetables in the open air, and are called the inorganic constituents, and from 3 or 4 parts in the 100 of the vegetables before being burnt. It is this and the next division that most require the consideration of the agriculturist.

III., Particles injurious to vegetation, and which are mixed intimately with the base. They are—1st. Protoxide of iron which consists in the blue and yellow clay, which combines with phosphoric acid and forms "rust." 2nd. Too much magnesia is a caustic, which sometimes happens when the magnesian limestone is applied. The magnesia not attracting the carbonic acid, and becoming neutral as soon as lime. 3rd. Decomposing organic matter, which both attracts the oxygen from the atmospheric air in the ground, and charges the ground with noxious gases. Such is nearly the constitution of the soil. The earthy or inorganic medium of vegetation, and which but supplies some three or four parts in the 100 of the vegetables produced from it,—the rest coming from aerial medium, the atmosphere. Ammonia is not considered as a constituent of the soil, for it is never found there except in the smallest quantity, and it raises into the air during the day and falls with the dew during the night. All culture and improvement of the soil may be considered in relation to the above three divisions, and it is with consideration to the kind of base of the soil, that we are to direct attention as to the leveling draining, and to the other mechanical operations or removal of quicks, collfoot, and other weeds, sowing the seed, and for liberating the fertilizing particles of the soil which are by nature bound up with the base, and though they form but three or four parts in one hundred of the soil, when we consider the quantity of soil contained on an acre of ground from 6 to 9 inches deep, and when we consider the small quantity removed by each

crop, sometimes 2, sometimes 1 or less per 100 of the green vegetable. It is no wonder that they are not exhausted; besides by nature, they are only liberated at a certain unknown rate per annum by the dis-integrating causes, frost, heat, and moisture; and this rate is found too small to support a crop of vegetables every year, so that it is found needful to re-apply the inorganic constituents in the form of manure. Means are also instituted for increasing the disintegration of the base, as burning of the soil, which effects a chemical decomposition, in which potassa is liberated, and if a soil has been allowed to disintegrate for several years in succession, then it will support a crop every year until these are exhausted, provided that no particles injurious to vegetation are contained in the soil. You may wonder how it is come to the conclusion that these compounds are the fertilizing ingredient in the soil? It is done so because, 1st, They are invariably found to constitute the ashes of plants, and as every plant has its own kind of ashes, it grows in proportion to the quantity of its ashes found in the soil, as inorganic constituents in a disintegrated state. 2d, The analysis of soils marked fertile, always contain more per hundred parts of the substances termed fertile ingredients, than the analysis of those marked sterile or barren soils. 3d, The addition of substances to the soil similar to what are termed in the second division, fertile, are always found to increase vegetation, provided that the injurious particles in the third division are removed. 4th, The soils which support a grain crop for twenty years together, is found to contain these fertile ingredients in large proportion. 5th, The unfruitful granite soils, containing few fertilizing particles, are rendered fruitful by being mixed with powdered traprocks, which contain them in abundance; and "in St Michael's, one of the Azores, the natives pound the volcanic matter, and spread it on ground, where it speedily becomes a rich soil, capable of bearing luxuriant crops.

DIRECTIONS FOR USING GUANO.—1. It should never be employed in contact with seeds, as it kills them immediately they begin to vegetate. 2. It should be mixed as equally as possible with about four times its bulk of finely pulverized earth, burnt clay, turf, or pot ashes, after they have become cold. If sand is used, about twice its bulk will be sufficient. 3. The quantity per acre may vary from two to four cwt. according to the nature and quality of the land. Recent experiments have shown that a quantity which proved beneficial on poor soil, became deleterious upon land previously rich and well manured. 4. The best time for applying it is shortly after vegetation has commenced and immediately before rain or during damp, warm weather. 5. The best mode of application is, to divide the quantity per acre into two or three equal portions, and sow them broadcast at intervals of about ten days or a fortnight. 6. For small allotments it may be more convenient to use it in a liquid state, mix four pounds of Guano with 12 gallons of water, and let it stand for twenty four hours before being used. The same guano will do for mixing again with the same quantity after the first is drawn off.

WOUNDS AND BRUISES ON HORSES.—Take one quarter of a pound of saltpetre, half a pint of vinegar, half pint of spirits of turpentine; put them together in a bottle, and shake up before using. Apply it to the wound with a feather, three times a day.