

to yield the different mineral substances which it contains, as means for the production of another growth. It improves the mechanical texture of land; this is but one of its smallest uses. It powerfully aids the disintegration of the minerals (grains of sand,) in a soil, which contain many of the necessary elements of plants, and which, without the *fluxing* or *fusing* power of lime, would still retain them. This is one of its greatest and most important uses, and we cannot yet say, whether or not, lime, when applied to a soil, does not act more beneficially in this way than in any other. More investigations by chemical analysis, assisted by practical experiments, must be made than have yet been, to settle this question, and to determine in what manner, under what circumstances, and in what quantities lime acts best. In none of the soils which I have examined, has it been found in sufficient quantities, except where, at some time or other, it has been applied artificially. For other information—see the article on it, under the head of Manures.

MAGNESIA.

Magnesia is the oxide of rust of a metal called magnesium, which never exist naturally in a pure state. It is one of the necessary constituents of soil, being found in the bones of animals, and in the roots, stalks, leaves, and grain of plants. It has, in many respects the same action as lime, and to a certain extent can be substituted for it. The quantity of it varies in different soils. In some I have found as much as one per cent equal to about three hundred bushels to the acre, to the depth of twelve inches, and in others but a mere trace. The facts to show what the best quantity is in a soil, are very meagre. As far as my knowledge extends, I believe that where it exists in a less quantity than one-tenth of one per cent in a soil, magnesian lime is the best application for that soil. There have, as yet, been no experiments on the subject, and no means taken any where as far as I know, save in Maryland, to lay down any foundation for experiment that will be worth any thing when made. My own knowledge, as to the action of it, is derived from gentlemen who have used both magnesian and oyster shell lime on their lands, and from analyses of the soils which I subsequently made, have led me to the above opinion, and are the only data yet given to the agricultural community on this subject.

POTASH.

Potash, the oxide or rust of a metal called potassium, is another of the necessary constituents of soils. In union with silicic acid it gives strength and firmness to the stalk, and to the husks or envelop of the grain.

The proportions in which I have found it to exist in soils are very variable, from a mere trace in some, to as much as (1.20) one and two-tenths of one per cent in others. But a very small quantity is absolutely necessary. I have known a very productive