

MARL.

The term *Marl*, in the sense in which it is used in the district of country where my labors have been, is assigned to two substances distinct in their physical properties, and essentially different in their chemical composition. This difference is denoted in its name by the addition of *shell* in the one instance, and Jersey or green sand in the other. The one is called shell marl, being derived from shells; the other is called Jersey marl, from having been first used for manuring in New Jersey, and also green sand from its color and appearance. I shall now only speak of shell marl, or that derived from decayed shells, reserving a section for the exclusive consideration of the green sand or Jersey marl.

The shell marl, as may readily be supposed from its origin owes its valuable properties to lime, which exists in it in the state of carbonate; also contains about one seventy-fifth of magnesia. In some rare instances, however, the quantity of magnesia is as much as five per cent. Phosphate of lime is present also in some deposits, in others there is a mere trace, and frequently it is entirely absent. In some marls a small quantity of lime is present as sulphate.

The quantity of magnesia is not estimated separately from the lime in any of the marls, unless it forms at least two per cent. A particular description of the physical characters of each marl is not given with its analysis in the report on the marls of the different counties, as it would lead to no better knowledge of their constituents. It is enough to say in this place, that they differ very much in different localities, both as regards appearance, the state of division of the shells, and the quantity of lime which they contain. Sometimes the shells are almost as perfect when first exposed as those in the recent state; some crumble into fine powder on exposure to the atmosphere, whilst others remain sound for a long period of time; some have the appearance of dirty lime, scarcely a vestige of shell being visible; others are consolidated like mortar, and have to be dug with pickaxes, often coming up in large hard lumps, which gradually fall to pieces on exposure to the air. Other specimens, again, have a brick red color and are very hard, obtaining both their color and consistency from agglutination, caused by the per oxide of iron. They vary as much in their agricultural value as in their appearance, some containing as little as ten per cent of carbonate of lime, with only a trace of magnesia, and none of the phosphates, others having as much as seventy-six per cent of the carbonate of lime, and others two and one-fifty per cent of the phosphates. The *appearance* of the marl is a very *imperfect* indication of its value. Some in which there is but a mere visible appearance of shells, yields as much as fifty per cent of air slaked lime, whilst others, which *appear* to be made up entirely of shells, have not more than twenty or twenty-five per cent. In the one case the shells have become disintegrated by heat and moisture, no current of water passing through them during the process; in the other, water