

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-fifth 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 charged with carbonic acid has circulated through the shell beds, dissolving and carrying away the lime, the *essence* of the shell, and has left only its form unbroken. As a general rule, those shells imbedded in clay, or which have a large admixture of it, contain more lime than those which have a sandy foundation, as water percolates easily through sand, carrying with it some of the lime by mere force of attrition, and dissolving more when charged with carbonic acid. Water charged with this gas very readily dissolves lime in the state in which it exists in shells. In many beds of marl the *form* of the shell only is left, all of the lime having been dissolved by the above process. The lime in marl is as good, pound for pound, as that which exists in limestones, and has the advantage from its admixture of sand and of clay, of being more easily incorporated with the soil. It is identical with it in every respect, serves the same purposes, answers the same end in the production of vegetation, and should be used to fulfil the same indications, viz: to supply lime to a soil deficient in it. Its application then resolves itself into a mere question of cost. The per centage of lime in a marl being known, its owner can determine for himself whether he can, by using marl, apply to his soil any given number of bushels of lime cheaper than he can by buying lime. An allowance must be made in the marl for the application of a larger quantity of lime than is represented by its analysis, as all of the lime in it cannot at once be made available, in consequence of some of the shells not being entirely reduced to powder. In making this comparison, however, it must be understood that the agricultural lime seldom contains more than eighty-five per cent. of lime. Another item in this comparison is, the greater facility with which lime in marl admits of thorough incorporation with the soil. The inert lime for the present in marl varies in every specimen, and depends on the quantity of large shells which are found in it, and the facility with which they fall to pieces when exposed to the atmosphere. These are then the four sources from which lime is de-