It has been ascertained that 1,000 lbs. of maize or Indian corn contain 15 lbs. of the Phosphate and Sulphate of lime, but a complete analysis of the whole plant has not yet been made as far as has come to our knowledge. Every soil depends for its fertility mainly upon its containing due proportions of certain mineral matters. We find however, that nature's laws admit plants (in cases where one or more of these are deficient,) to substitute certain others, but this is confined within well defined limits. For instance, one alkali or alkaline earth may supply in part the place of another, and some acids may be partly supplied by others, but here those partial substitutions stop. As an instance for illustration, we may give the fact, that where soda and pot-ash are deficient in a soil, their place is partly supplied by lime, but if all three be absent, the soil will be absolutely sterile however well, we might manage it in all other respects, except in supplying the deficiency. Hence we would remark, that to determine whether lime "acts as a manure," we must know in what sense the term is used. If we mean by manure, such substances as upon being added to a soil, increase the growth of plants therein, it follows that lime as well as many other matters essential to vegetation, act as manures only in such soils as do not contain them in due proportion. We shall conclude this branch of our investigation with the following maxims, viz :

1. Lime is an essential constituent of plants.
2. That plants will not thrive when it is entirely absent from the soil.
3. Chemical analysis has demonstrated that lime exists in all fertile soils, that have hitherto been accurately analysed.
4. In such soils as are absolutely sterile, it has been proven when they have been analysed that some of the essential inorganic substances are absent; and that it is lime very frequently.

Having hitherto treated of lime only as a mineral constituent of plants, we proceed to shew that lime and the alkalies serve other important purposes of vegetation.

Section 3.—*Of the effects of lime upon the substances composing the soil.*

Lime and the alkalies act energetically upon organic textures living or dead; the action of the alkalies pot-ash and soda, is but slightly lessened even when they are in combination with carbonic acid. The action of carbonate of lime however, is far more feeble than quick lime. In hastening vegetable decomposition the alkalies and lime also, accelerate the liberation of the inorganic matters contained therein, and at the same time, produce a more ready supply of humus, useful to the plant in all stages of its growth, but more particularly so, when young, and before it has many leaves to get sufficient supplies of carbonic acid, ammonia and water from the atmosphere. Lime and the alkalies decompose many stoney bodies and liberate matters useful to vegetation.

Most of the rocks of Maryland contain lime, pot-ash and soda