

that organic matter as they exist in solutions of soils had any effect on this reaction.

We also know by the analysis of Sprenger, that a lucerne crop of 8.5 tons contains of.

Soiling 6.5 tons, containing of Chlorine,	13 lbs.
Hay 2 " " " " " "	14 lbs.

Total amount of Chlorine 27 lbs.

If we take this as an averaging crop per acre, then according to the preceding 27 lbs., or we will say 30 lbs. of Chlorine (equal to about $\frac{3}{4}$ bushel of common salt) must be contained in 6,000,000 lbs. of soil (one acre) to produce the average crop of lucerne, and consequently every part of the soil has to contain 1-200,000 of its weight of Chlorine; or if we dissolve the Chlorine in a certain quantity of this soil by a solvent of equal weight, the solution will also contain 1-200,000 of Chlorine, and by evaporating from it one-half, a solution will be obtained which contains 1-100,000 of Chlorine, an amount which can be detected by nitrate of silver, as above stated.

For the purpose of testing a soil for its sufficiency or deficiency in Chlorine, it is therefore only necessary to take a certain portion of the prepared solution of the soil; to evaporate from it one-half and to test with nitrate of silver. If no precipitate occurs after heating and stirring the mass, it is a proof for the deficiency of the soil in Chlorine.

DETERMINATION OF LIME AND MAGNESIA.

Both Lime and Magnesia exercise a double action as constituents of soils; on one side they present themselves as fundamental ingredients of soils, participating in the formation of the Cement, and as such, their sufficiency or deficiency in soils is expressed by the condition of the Cement; on the other side they serve as directly nourishing substances to plants, and only to this extent can they be subject to our discussion in this place. Experience teaches us in this respect, that it would be difficult to find out a cultivated soil, which would show itself so deficient in Lime and Magnesia, that it could not supply that portion of them which the plants require as nutriment. For this reason it cannot be of any practical use to determine the quantities of Lime and Magnesia which may be extracted from soils; it is however a matter of importance to have an idea of the mutual proportion of their quantities; and for this purpose the following treatment may perfectly answer:

Take two equal parts of the original solution of the soil (about a quarter of an ounce for each) and add to the one an equal volume of alcohol and a few drops of sulphuric acid; the whole quantity of