CHAPTER II.

FORMULA FOR MANUAL EXAMINATIONS WHICH WILL LEAD TO A CORRECT JUDGMENT OF THE DISTINCTIVE QUALITIES OF SPECIAL SOILS.—*Manner in which samples of soil must be taken for analysis—examination of the mechanical texture of the soil—determination of the quantity of Quartz-sand, and undecomposed fragments of rocks—of the quantity of Cement—of the character of the rocks—of the water-retaining power of the Cement—of the physical state of the Cement after drying—of the absorbent powers of the Cement for gases, and moisture, &c.—Examination of the directly nourishing properties of the soil—determination of Phosphoric acid—of Sulphuric acid—of Chloride—of Lime and Magnesia—of Silicic acid, Potash and Soda.*

We have tried in the preceding chapter to collect and exhibit general facts for a thorough *understanding* of the functions of soils, so far as they relate to the wants of plants; all that remains for this final chapter, is to give such a formula for manual examinations as will lead to a correct *judgment* of the quality of special soils. The method in which these examinations may be conducted, is distinctly dictated by our preceding considerations; we therefore have to act here in accordance with them; avoiding elaborate analyses, which, notwithstanding their troublesome performance, have shown themselves to be not of the greatest practical utility.

Before commencing the analysis of a soil, it is *first* necessary to observe that the sample was taken in the following manner:

With a clean spade a hole should be dug to the depth of the surface soil; and a slice of uniform thickness (about one inch) then be taken from the top to the bottom of the hole. This operation should be repeated in three or four different places on the *same kind* of soil; the different specimens thus obtained should then be mixed together, and about two lbs. of the mixture be put in a clean bag for analysis. Specimens of the subsoil should be taken in the same manner as those of the surface soil, special care being taken to prevent any mixture of the surface soil with it.

If the specimen of soil is not properly taken in the above manman, its analysis may prove nothing when done.

It is, *secondly*, necessary that the specimen is labeled with the name of the owner of the soil, and the State and county from which it was taken.

Thirdly and finally, should the specimen be accompanied by a note in which information is given, as to the location of the soil;