WHAT CORRELATIVE LABORATORY WORK IS IT DESIRABLE TO DO?

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Although the duties of a Soils Department are manifold, the phase that I shall consider briefly is research. We believe that it is imperative that soils be studied as such, if we are to develop the science of the soil as it should be developed. It seems that much of the researches on soils could be justly criticized because of the limited numbers that have been considered in the studies. This has been due in no small measure to the methods of attack,—that is to say, many of them are tedious and long drawn out, and make comparison of large numbers impracticable.

A brief consideration of two lines of our researches should be profitable; namely, (a) the relationships of soils and water, and (b) the solubility of soils.

SOIL MOISTURE.

Probably no other relationship tells as much about the soil as does the moisture. It tells us much about organic matter, colloids, texture, activity, etc. The old classification of soil moisture, or one in general use, divides the water into three forms,—hygroscopic, capillary, and gravitational. The hygroscopic is the very thin film on the surface soil particles and is not acted upon by gravity or capillary force. The capillary water is that which is retained in the capillary spaces of the soil and may be moved by capillary action. The gravitational water is that in excess of the capillary water. We are forced to admit that the classification is based on the old idea that the soil mass is merely a framework of solid particles of various sizes and shapes, and the soil moisture functions as a free liquid. This classification has been of practical value and service in the studies of the control of soil moisture, yet it is too empirical and does not throw light on the really complex relationships that exist between soil and water.