Rapid Determination of the Colloidal and Mechanical Analysis of Soils.

George John Bouyoucos.
Michigan Agricultural Experiment Station.

Introduction.

The hydrometer method has been proposed as a simple, rapid and reasonably accurate method for determining the colloidal material in soils and also for making a rapid mechanical analysis of soils. From the examination that this method has thus far received, it appears that it is able to accomplish these determinations and to give reliable results.

Apparatus.

The apparatus required consists of five pieces: (1) stirring motor, (2) cup, (3) hydrometer, (4) cylinder and (5) thermometer.

The stirring motor and the cup are of the standard soda fountain type. The cup has baffles inside which prevent the soil water mixture from going into a circular motion, and cause it to be churned, thus immensely increasing the dispersion process. The motor with the modified cup, make a mist remarkably rapid and efficient method of dispersing soils. With this method the majority of soils can now be dispersed quite completely in about ten minutes as compared to 24 or 48 hours by the ordinary shaker methods.

The hydrometer has been specially made for this purpose. It was calibrated on actual soil suspension by making a mark at the points where it came to rest in the soil suspension and then evaporating the latter to dryness to determine the actual amount of material in suspension. It reads in grams of soil material per liter of water. It has been made of sufficient volume and weight to give it sensitiveness.

The special cylinder is of the 1000 cc. type and has two marks on it, one for the use of 50 grams and the other for 100 grams of soil.

Any reliable Fahrenheit thermometer may be employed. The thermometer is needed to take the temperature of the soil suspension in order to make the proper corrections.