DETERMINATION OF THE QUANTITY AND "QUALITY" OF COLLOIDS IN SOILS

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The importance of studies of the colloidal material in soils is being stressed more and more each year. That a determination of the quantity of colloids present is desirable in connection with soil profile studies has been recognized for some time. That the quality or character of the colloid present may be of equal importance is also beginning to be recognized.

In the absence of the chairman of the subcommittee on soil colloids, the general chairman of the committee on correlative laboratory work has submitted four questions to members of the subcommittee. The following discussion is based largely on answers to these questions.

1. Should methods of mechanical analysis be modified so as to include a determination of the quantity of soil colloids?

Dr. Gile states (11) that a determination of colloidal material should supplant a determination of the clay fraction in mechanical analysis. It is unnecessary to determine both clay and colloid since the clay fraction includes the colloidal material.

"If one micron (0.001 mm) is taken as the upper limit for the colloidal fraction this substitution would, in the case of many soils, involve only a slight change in the statement of mechanical analysis. Results that we obtained some time ago by the ratio method of determining colloids indicated that usually about 90 per cent of the material in the clay fraction (particles below 0.005 mm) is colloidal material (particles below 1 micron). In other words, most soils apparently contain only a small quantity of material present as discrete particles of 5 microns to 1 micron in diameter.

"Although this change would not be of great moment in the case of most soils, if the clay fraction has been accurately determined, I think it is important, since it is a step toward a more accurate estimation of properties of the soil. The small quantity of material as discrete particles between 5 microns and 1 micron is similar to the true silt fraction in composition and properties, and is quite different in these respects from the bulk of the colloidal material. It should therefore form part of the silt fraction rather than of the colloidal fraction."

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1Report for the Subcommittee on Soil Colloids of the American Soil Survey Association. Presented at the meeting of the Association held in Chicago, Ill., Nov. 15, 1927.

2Associate in Agronomy (Soils), Ohio Agr. Exp. Station, Wooster, Ohio, General Chairman of the Committee on Correlative Laboratory Work.

3The Subcommittee comprises Richard Bradfield, Missouri, Chairman; George Bouyoucos, Michigan; P. L. Gile, Washington, D. C.; and P. R. McMiller, Minnesota.

4Reference by number is to "Literature Cited," p. 898.

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