SYMPOSIUM—SOIL COLLOIDS

1. THE CHEMICAL NATURE OF COLLOIDAL CLAY

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The investigations which have contributed to the knowledge of the chemical nature of colloidal clay fall into two major groups. The first group may be called direct methods, indicating that the investigation was made on colloidal clay isolated from all non-colloidal material. The second group may then be termed indirect and includes all investigations made on soils as a whole or upon synthetic products thought to be similar to colloidal clay in certain of their properties. Investigations of the second type are by far the more numerous. This is probably due to the fact that convenient methods for the isolation of colloidal clay in sufficient quantities for intensive investigations have been developed in only the last five years. High powered centrifuges are necessary and, as yet, but comparatively few laboratories are equipped with them.

The indirect studies on soils which are most applicable to this subject include (1) acidity, (2) absorption, and (3) basic exchange investigations. The other group of indirect studies made on synthetic products considered similar to those existing in the soil include many of the investigations (1) on the artificial zeolites or permutits and (2) on colloidal silicic acid, aluminum hydroxide, and ferric hydroxide. Those who work with the synthetic products have the advantage of working with systems apparently somewhat less complex chemically than the natural product. About as little is known, however, concerning some of these so-called “simpler colloids,” like silicic acid, as is known about the colloidal clay extracted from the soil. Valuable as such studies may be from the standpoint of colloid chemistry, their applicability to naturally occurring clays is uncertain. Colloidal clay

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