OBSERVATIONS ON PLASTIC FLOW IN SOILS.  

By

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Previous papers and reports before this Association (have dealt with the definition, general nature, and nomenclature of soil consistency. This paper deals with its measurement. Consistency in soils has various manifestations depending upon the degree of wetness. At lower moisture contents when stress is applied to soil, phenomena of rigidity and brittleness are exhibited and soil is said to possess friable consistency. At higher moisture contents, under stress, soil exhibits flowage, and its consistency is described as plastic or viscous. This paper deals with measurements of plastic consistency.

In any attempts to give numerical expression to plastic phenomena in soils, one is concerned with three things, first, the degrees of wetness which mark the transition from the plastic to the friable regime on the one hand, and the transition into the viscous regime on the other, second, the magnitude of the plastic range, and third, the magnitude of the resistance to stress at various water contents.

In recent years the Atterberg system of expressing plasticity in terms of the moisture percentages which mark empirically defined plastic transition points has come into vogue in several American laboratories, and literature embodying numerous Atterberg consistency determinations is beginning to accumulate. When the soil structure and consistency committee of THIS ASSOCIATION was established, a study of the reliability of Atterberg constants was recommended (20) and subsequent reports (21, 22) of THIS ASSOCIATION contain numerous references to the possibilities of Atterberg determinations in consistency evaluation.

It is beginning to appear that one of the serious shortcomings of the Atterberg methods is the inability of workers to agree on details of technique which seem to be highly important if comparable results are to be obtained. There seems to be a great need for investigations along the line of standardization of mechanical technique. More important, however, the whole field of consistency phenomena in soils needs elucidation. Until that is done, the value of Atterberg constants as the writer sees it, is questionable.

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