

## INTRODUCTION.

When a moulded lump of soil is placed in water, either before or after drying, generally speaking, it breaks up completely within a reasonably short time. At the suggestion of Professor Hardy, this work has been carried out to investigate the possibility of basing a method of classifying soils on differences in this time of disintegration when measured on standard lumps of soil at a standard degree of moistness.

The idea has previously been used by Sir. Francis Watts to differentiate between soils suitable for use as puddling clays and those unsuitable for that purpose.

The present investigation follows up some preliminary work of Prof. Hardy. He worked up samples of various soils to their points of stickiness, and then moulded them into suitable shapes, allowed them to dry and measured the time necessary for them to reach a given stage of disintegration. None of his methods was found satisfactory, but he tried the following:

1. Spheres made of such a size that when dry they would not fall through the constricted part of an ordinary lamp glass chimney. The time was taken for the sphere to become small enough to drop through. This failed on account of loose material blocking the narrow part of the glass in some cases, and in others through the sphere cracking across and falling through almost at once.

2. As (1) but with a penny and/or a glass stopper on top of the sphere to help it through. Effect of half submergence instead of complete submergence was also tried. Not any more successful.

3. Cones substituted for spheres. This was also unsatisfactory, as the soil came away in lumps from the pointed part rather than peeling off evenly. Air bubbles were also disturbing factors as they collected around the lower part of the constriction.

4. Spheres constructed with a central perforation and hung on a string in water. This was quite useless, owing to the cracks which developed from the hole, causing premature dropping.

5. Spheres stood on short lengths of gas piping in water. The formation of cracks again interfered, but was less troublesome than in method (4).

Bouyoucos (Soil Sci. 1924 XVIII 103) discusses the forces involved in soil granulation and suggests that water tends to separate the particles of a compact mass of soil by causing swelling of the colloidal particles and by diminishing the attractive forces between the particles. It will be seen later that the results of the present work can be explained satisfactorily on this basis.