

INTRODUCTION.

During the past few years there has been increasing interest taken in Organic Matter in Relation to Soils. Looking through an Imperial Bureau of Soil Science summary of as recent a date as March 1933 one was struck by the work on various aspects of Organic Matter in Relation to Soils, which was proceeding in the various parts of the world. From Canada came reports of experiments on "The manufacture of manure-like material from straw", Nyasaland reported on "The preparation of a new form of compost after Howard and Wad's methods" whilst in Iowa investigations on humus were evidently proceeding-"The formation of humus and the decomposition of Organic Matter in Soils".

A glance at current journals reveals the fact that many papers are being published on Composts, Pen manure, Humus and a host of related problems.

Outstanding among contribution to this literature are such names as Waksman - a prolific writer, Page, Norman, Richards. The field of investigation is enormous, from the crudities of "Synthetic" Organic Manure and plant residues it merges imperceptibility into Cellulose investigations, bacteriological studies, physical enquiries concerning colloids, and so on to researches which can hardly be recognised as being of any connection with Soil or Plant.

Thus it behoves anyone entering this field to aim at some definite object, to set a course across the field which has not any boundaries and to browse on the vegetative offshoots on the way rather than to graze extensively over such an ill-defined area.

The Problem.

Transcribed into problematical form, the title of this dissertation appears to be:-

- (a) What is the nature of Organic Matter required and present in the ideal soil?
- (b) How can this material be prepared from plant residues and added to the soil?

A study of the humus-like material derived from the rotting of plant

residues should be extremely valuable in approaching the study of the humus of the soil. If the composition and properties of such material is worked out it must necessarily be of great value in the study of the organic material incorporated in the soil. The investigation of compost therefore offers a line of approach to the organic matter of the soil, for this rotted material must be at least the precursor of Soil Organic Matter. Centuries of agricultural practice have established the fact that the humus status and consequent properties of the soil can be maintained by the addition of compost. This indicates two possibilities.

- (a) That compost "Humus" in a fine state of division or reduced to a fine state of division undergoes physical incorporation with the mineral matter of the soil.
- (b) That compost "Humus" undergoes chemical modification before incorporation with the mineral soil.

In the latter case as has already been pointed out, valuable information will have been obtained, as in many other Organic and Biochemical studies, if the precursor of the material under investigation is closely studied.

The name Humus requires explanation. In this dissertation it will be treated as an abbreviation of the more cumbersome term "Soil Organic Matter".

Humus does not imply a definite static chemical compound, it may be only a state of matter or a stage of a reaction - a physical complex of organic material.