Organic soils are developed mainly from plant remains and in this respect they constitute a distinct and separate division of soil classification in comparison with mineral soils. This paper is an effort to emphasize some essentials in the identification and systematic treatment of different organic soils (peat and muck) described in detail elsewhere.

Definition of Peat and Muck as Organic Soil Materials

The term, "peat and muck", is used here in its widest sense. It designates also surface organic matter with distinctive characteristics that is at least ½ meter in thickness, supports vegetation and is derived from it. Outstanding considerations are, first of all, the physical and morphological characteristics of peat and muck that developed from the plant remains contributed by peat-forming vegetation. In any particular locality the organic materials of an area of peat present many features but the relative composition and texture of peat and muck are considered of primary importance. They are most easily expressed and symbolized on the basis of their origin (1) as recognizable primary or parent materials (peat) that are the product of vegetation and (2) as variously changed secondary products (muck, peat—humus) that have been developed by soil-forming agencies from the decomposition of the parent materials.

Peat is defined as plant remains in a moderate state of preservation and with a content of mineral matter not exceeding 35 per cent. The general properties are the result chiefly of the constructive work of natural vegetation since the mineral substratum and the activities of micro-organisms causing decay, play only a subordinate role. It is well established that saturation with water and lack of air result in an anaerobic condition and that the organic materials are in a state of reducing action. Of the several classes of peat some are composed of fine to very finely divided organic sediments and colloids, comparatively dense and plastic; others consist of coarse, medium to finely fibrous constituents, porous and light in weight, while still others consist of granular to lumpy woody fragments. About twelve separate kinds of peat have been identified by reason of the differences in the character of the respective natural units of vegetation that gave rise to them under conditions of impeded water movement and diminished aeration.

Within each primary class of peat there is comparative uniformity of composition, size, assortment of component parts, and physical properties. There are, however, peats that consist of mixtures of two or more of the principal components, such as sedimentary-fibrous or muck formations may take but further progress is comparatively arrested when the moisture content is too high or is reduced to an amount too low for chemical changes and microbial activity.

The distinguishing characteristics of various forms of muck, as compared with peat, are a more or less advanced degree of decomposition, darker color, and heavier texture indicating a greater content of residual products closely correlated with drainage and the presence of micro-organisms active under anerobic conditions. Muck and humus are products of forces that are predominantly constructive. It still remains to be determined experimentally how contact with atmospheric oxygen, micro-organisms, and mineral salts affect the rate and extent of decomposition and the nature of the products developing different kinds of peat. Muck and humus represent transformation products; they are largely of organic substances that are dissolved and gaseous products but chiefly residual material with a mineral (ash) content not exceeding 65 per cent. They occur in a great variety of phases because of the differentiating tendencies of climate, the effect of leaching of soluble salts in ground waters and mineral soils, and the kind of parent peat material undergoing decomposition.

For descriptive purposes there is a distinction between at least two forms of residual organic soil material, giving the principal weight to natural states of deposition, irrespective of the origin of the peat or condition of formation. The distinguishing characteristic of the organic material termed muck is its coarse to finely granular friable and crumbly structure and dark brown or black color. In dry condition, much of the material can be shaken out of layered or matted roots and leafy litter. Differences in age and in content of mineral salts determine the rate and direction which the process of muck formation may take but further progress is greatly impeded and diminishes rapidly material arrested when the moisture content is too high or is reduced to an amount for chemical changes and microbial activity when cultivation destroys normal organic development.

The second main type of residual organic material is generally designated peat-bog. It includes organic matter that is well exposed, highly colloidal or nearly amorphous shrinks considerably upon drying, but is plastic when wet and leaching of absorbed bases has taken place. The mobility of the residual products is dependent on the direction of the ground water movement; in regions they are leached out downward always.

The differences between these two forms of muck are

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