

Island. Neither must it be thought that the percentage of total phosphoric acid which occurs in the parent rock is exceptionally high, for it is not. There is either something in the lamellar method of weathering which enables the phosphate to become available, or, alternatively, the metamorphism—the pressure and heating—to which the rock has been subjected has made the phosphate available, acting perhaps as the furnace acts in smelting the iron-ore in the Bessemer process, when the slag of the ore becomes converted into a fertilizer in which 80 per cent. of the phosphate is available. It would seem, therefore, that while the proportion of available to total phosphoric acid in ordinary soil is about 10 per cent., in a mica-schist soil it would amount to from 25 to 30 per cent. of the total present.

The experience of the mica-schist type of rock in other countries is rather contradictory. Primrose McConnell (England) in "Agricultural Geology" (1902), states that mica-schist crumbles down with comparative ease and gives a soft friable deep layer of rich soil. On the Breadalbane chain of hills (Ben Lawers) this is exemplified by the intensive flora of alpine and Scandinavian character, rich and well developed in contrast to the poor appearance on the granite of Braemar and Ben Nevis. The pines and larches are magnificent on the decomposed mica-schists of the Highlands generally, but are poor stunted sticks on their cold clays of granite. On the Kingsbridge estuary, in Devon, there is a flourishing vegetation on this rock, including orange and lemon growing in the open air where sheltered from the south and south-west winds. In Ireland the rich green pasture and good "heath" land on the same formation near Knocklayd and Ballycastle, County Antrim, may be noted.

Hilgard, the great American soil chemist, in "Soils" (1906), states that mica-schist, being a mixture of quartz and mica only, not only weathers slowly, but also supplies but little of any importance to plants in soils formed from it. Such soils would be mostly absolutely barren but for the frequent occurrence in this rock of accessory minerals that yield some substance to the soil. Yet it remains true that as gneiss and mica-schist are among rocks in which mineral veins most commonly occur, the proverbial barrenness of mining districts is frequently traceable to these rocks. The difference between American and British opinion regarding the value of mica-schist as a soil-former is remarkable, but probably has some simple explanation, such as the amount of phosphate which is present. There are, moreover, several distinct kinds of mica, which vary greatly in the rate at which they break down or weather in the soil. It is not to be inferred from this that the phosphate is necessarily included in the mica; but wherever mica occurs in South Island soils it appears to be an indication of the presence of available phosphate in good quantity.

H. W. Wiley, in "Principles and Practice of Agricultural Analysis" (1906), points out that the schists include an extremely variable class of rocks of which quartz is the prevailing constituent, and which as rocks are deficient in potash and other important ingredients of plant-food.