

table growth. The roots of plants may be **unable to penetrate a soil** because of its hardness, or the presence of stagnant water may have the same effect. A plant in sending its roots into the soil, requires not only that the roots shall be able to extend through the soil in search of food, but that the soil shall also be in a healthy condition. A supply of water is necessary for the roots, but a supply of air is equally necessary. When the soil is charged with an accumulation of stagnant water, the roots which come within its influence **are unable to discharge their functions** in a healthy manner, and the growth of vegetation is consequently very slow and imperfect.

46. Another condition of fertility is the presence in the soil of **all** the food which the crop requires. An abundance in the supply of one portion of the food does not compensate for a short supply of another equally important portion of the food. Hence the fertility of a soil is determined by the quantity of that essential food which is present **in the least proportion**, and not by that which is in great abundance. To illustrate this by a familiar example, a builder may have plenty of stone for the construction he intends to erect, but if he has little mortar his progress is soon stopped for want of a further supply. It would not assist him if you increased his supply of stone; he wants something else, and until this is ready for his use he can make no progress. It is the short supply of mortar which regulates his work, and not the abundance of stone. It is just the same with vegetable growth; the plant requires a variety of materials, and that essential material which is present in the least abundance regulates the crop, and not those which are more plentifully supplied.

47. The terms **good** and **poor land** have reference to the relative productive powers of land. In a good soil we have a combination of conditions favourable for the production of large crops—we have a soil with

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