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They may be clayey, sandy, peaty or calcareous, as one or other of these constituents predominates.

Fertility.—The fertility of a soil depends on its chemical composition and on its physical texture. The useful physical characters are (1) sufficient looseness to afford easy penetrability to roots, to moisture, to air and to fertilizers; (2) sufficient retentiveness to prevent a rapid loss of water and fertilizing material. These properties depend on the relative proportions of sand, clay and humus which constitute the soil. Too much sand makes a light soil easy of cultivation and readily dried, but not retentive of moisture and fertilizers. An excess of clay makes a heavy soil retentive of moisture and fertilizers, capable of giving a firm foothold to plants, but cold, impermeable and difficult to till. Where humus predominates the soil is often sour from carbonic and other acids, and is usually deficient in some of the elements of plant food. From the physical standpoint a good soil contains from sixty to eighty-five per cent. of sand, from ten to thirty of clay and iron oxid, and from five to ten of humus. As, however, the physical condition of a soil depends partly on rainfall and temperature, these must be considered along with composition.

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From the chemical standpoint a soil should contain all the elements which are necessary for plant growth in a condition in which they are assimilable. What these elements are is best learned from analyses of the ashes of different plants, a short table of which is here given :