

can be accurately determined. The knowledge we thus obtain enables us to supplement the results obtained by the mechanical analysis (19), and thus we can extend the classification of soils. The mechanical analysis enables us to determine whether a soil is a sand, sandy loam, loam, clay loam, or clay soil; and the chemical analysis enables us to determine whether they are calcareous or peaty. If there should be any large quantity of stone, gravel, or rock, or other exceptional matter mixed with the soil, these would add an additional character; as for example, a calcareous loam with much or little stone, gravel, or rock; or a sand with a large quantity of iron; or a loam with much organic matter, &c., &c. The term **marl** has been proposed for soils which contain from 5 to 20 per cent. of lime, but this is a term which should only be used for describing those beds of earth commonly known as marls.

CHAPTER II.

COMPOSITION OF CULTIVATED CROPS.

29. By the aid of chemistry we are enabled to learn what is the composition of our cultivated crops, and the sources from which plants obtain the materials of which they are made. We find that every plant has two distinct groups of bodies within its structure, and that these may be distinguished as **organic** and **inorganic** matter.

30. If any vegetable matter be carefully burnt, by far the greater portion disappears in the form of smoke, but a portion remains behind in the form of **ash**. This ash consists of mineral matter, and it is known as the **inorganic** matter of plants. It is sometimes described as "the ashes of plants," but in each case the mineral matter of the plant is referred to. When this ash is analysed it is found to consist of a large number of different substances, which are present