

## CHAPTER III.

## ON THE MINERAL SUBSTANCES THAT COMPOSE THE CRUST OF THE GLOBE; AND ON THE STRUCTURE OF ROCKS.

The constituent Elements of the simple Minerals that compose Rocks.—The physical Characters of simple Minerals composing Rocks.—Explanation of the Terms employed in describing the internal Structure of Rocks, and the external Structure of Mountain Masses.—Sedimentary Depositions.

THE most careless observer can scarcely fail to notice, that the mineral substances which occur on the surface of the globe differ from each other in density, hardness, colour, and other sensible qualities. Indeed, the different varieties of stone appear at first so numerous, as to render it difficult to become acquainted with them: but, however numerous these varieties may be thought, the simple minerals which compose rocks or strata are very few, and the elementary substances, of which each of these minerals is formed, are still fewer.\*

The elementary substances of which the solid matter of our globe is composed, are the *Earths*,—*silex*, *alumine*, *lime* and *magnesia*. The *Metals*,—*iron* and *manganese*. The *Inflammable Principles*,—*carbon* and *sulphur*; and the *Alkalies*,—*potash* and *soda*.—*Muriatic* and *Phosphoric Acid* occur also in the mineral kingdom. The newly discovered earths and alkalies, and metallic ores cannot be regarded as forming essential constituent parts of rocks: they chiefly occur in veins. The four earths above enumerated, together with iron, compose nineteen parts in twenty of the known solid matter of the globe. The Earths, when pure, are infusible, except at an intense heat; they are nearly insoluble in water at the common temperature: when pure, they are white or colourless. Though the earths are infusible when pure, if they are combined in certain proportions, they may be fused with facility at a comparatively low temperature.

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\* The mineralogist and the geologist consider those minerals as simple and homogeneous, which present no difference of qualities to our senses throughout the mass, although the chemist may discover that such minerals are composed of two or more elementary substances. Thus, limestone or marble is regarded as a simple substance, though chemistry has discovered that it contains, in every 100 parts, lime 57 parts, and carbonic acid 43. It is the latter which is expelled from it by burning; a process which is well known to make the stone lighter, and to render it caustic; in which state it is called quicklime. Nor do the researches of the chemist end here: the two substances, quicklime or pure lime, and carbonic acid, are themselves compounds: the former, lime, is a compound of a metallic substance called calcium, united with oxygen; the latter, or carbonic acid, is composed of oxygen and carbon or charcoal.