

specific gravity in all stones or earthy minerals if it much exceed 2.5, or approach 3 may be attributed : in other words, if they are nearly three times heavier than an equal bulk of water. Gems and the earths barytes and strontian are exceptions; but these never form entire rocks. The presence of iron not only increases the weight, and darkens the colour of numerous rocks and stones, but is one principal means of their decomposition, for iron exists in stones in two states of oxygenation, as the black or the red oxide; and when the former is exposed to air and moisture, it absorbs a greater portion of oxygen, and is converted into a brown ochrey incrustation, which peels off, and exposes a fresh surface of the stone to a similar process.

Manganese, in a state of oxide, occurs in a few rocks, to which it generally communicates a dull reddish colour inclining to purple, and a peculiarly dry and burnt-like appearance.

Sulphur, though found in considerable masses, cannot, by itself, be regarded as a constituent part of rocks; but when it is combined with oxygen, forming sulphuric acid, it unites with lime, and forms the well-known mineral gypsum or plaster stone.

Carbon, or *Charcoal*, enters, as a constituent part, into many of the slate rocks, to which, it generally, communicates a dark colour: it forms also regular beds of considerable thickness, being the principal constituent part of coal. Carbon, combined with oxygen, forms carbonic acid or fixed air, which is combined and solidified in all limestone rocks, in a proportion exceeding two fifths of the whole weight. As carbon exists in such a large proportion even in the oldest limestones, we may regard it as a constituent element, and not as a substance derived from the vegetable kingdom. For whence did the vegetables themselves derive their carbon?

Potass and Soda.—These alkalies occur in minerals which compose parts both of primary and volcanic rocks; but the proportion is so small, that they would scarcely deserve the attention of the geologist, did not the latter alkali, soda, exist in such abundance in the waters of the ocean and in rock salt. Pure sea salt, or rock salt, contains nearly $53\frac{1}{2}$ parts of soda, $46\frac{1}{2}$ muriatic acid or chlorine.

Muriatic acid, combined with soda, is the only state in which this acid forms a constituent part of any rocks we are yet acquainted with; except in some volcanic rocks, where it may be regarded as accidental.

Phosphoric Acid, combined with calcareous earth, is a principal constituent of animal bones: it occurs, also, in a few limestone beds, which are supposed to have derived phosphoric acid from the decomposition of animal matter. This acid is of very rare occurrence in the mineral kingdom.

The above elementary substances, either separately or combined, form all the simple minerals of which rocks are composed. A knowledge of these minerals, and their different intermixtures and combi-