

Effects on Contiguous Rocks.—Admirable examples of the alteration produced by eruptive masses are not uncommonly presented at the contact of intrusive sheets with the surrounding rocks. Induration, decoloration, fusion, the production of a prismatic structure, conversion of coal into anthracite, of limestone into marble, and other alterations, may be observed. The nature of these changes is described in Book IV. Part VIII.

Connection with Volcanic Action.—Many volcanic rocks occur in the form of intrusive sheets, as felsite, quartz-porphry, diorite, melaphyre, diabase, dolerite, basalt, trachyte, and others. The remarks above made regarding the connection of intrusive bosses with volcanic action may be repeated with even greater definiteness here. Intrusive sheets abound in old volcanic districts, intimately associated with dikes and surface-outflows, thus bringing before our eyes traces of the underground mechanism of volcanoes. They frequently occur among the rocks that lie beneath a mass of ejected lavas and tuffs, or traverse the lower, sometimes even the upper parts of the volcanic mass. They then appear to mark some of the later stages of eruption when the orifices of discharge had become choked up and the subterranean energy only sufficed to inject the magma between the bedding of the rocks below ground but not to impel it to the surface. It is observable that later intruded masses are often more acid than the lavas previously erupted.⁹⁹

Among the Palæozoic and Tertiary volcanic regions of Britain numerous illustrations of such sills are to be found. Some of the most striking are those that emerge from be-

⁹⁹ Trans. Roy. Soc. Edin. xxxv. 1888, p. 143 Quart. Journ. Geol. Soc. xlviii. 1892, Address, p. 177.