

be studied as a typical one for this class of phenomena. (See Book IV. Part VII. Sect. i.) Inland sections are abundant on the sides of the hills and in the stream-courses, while along the sea-shore the rocks have been admirably exposed. Two great phases or types of volcanic action during Carboniferous time may be recognized: (1) Plateaus, where the volcanic materials were discharged so copiously that they now form broad table-lands or ranges of hills, sometimes many hundreds of square miles in extent and 1500 feet or more in thickness; (2) Puys, where the ejections were often confined to the discharge of a small amount of fragmentary materials from a single independent vent, and where, when lavas and more copious showers of ash were thrown out, they generally covered only a small area round the volcano which discharged them.²⁰⁶

The Plateau type of eruption was specially developed during the deposition of the Calciferous Sandstones. Its lavas consist of augite-olivine rocks (picrites, limburgites), basalts, porphyrites, and trachytes, while its necks or vents are filled with agglomerates, felsites, and, in East Lothian, phonolites.²⁰⁷ Sheets of tuff are intercalated among the bedded lavas. The Puy type was, on the whole, of later date, reaching its chief development during the time of the Carboniferous Limestone. Its lavas are mostly basalts of various types, together with picrites, diabases, and porphyrites. Tuffs and agglomerates are abundant, not infrequently containing organic remains.

While the scattered vents of the puys, with their associated lavas and tuffs, occur on many horizons, the plateau lavas occupy a tolerably definite position in the Calciferous Sandstones, though sometimes confined to the lower part of that group, sometimes ascending to the very base of the Carboniferous Limestone series. This volcanic zone forms an important feature in the geology of southern Scotland. Composed of nearly horizontal sheets of porphyrite, diabase, and basalt, it extends from the Clyde islands on the west to Stirling on the east, and sweeps in high table-lands through Renfrewshire and Ayrshire. It reappears in East Lothian, and presents there some interesting and remarkably fresh trachytic lavas. Even far to the south, in Berwick-

²⁰⁶ Presidential Address, Quart. Journ. Geol. Soc. 1892, p. 105; Trans. Roy. Soc. Edin. xxix. p. 437.

²⁰⁷ F. H. Hatch, Trans. Roy. Soc. Edin. 1892, and Presidential Address just cited.