

tuffs, clays, thin conglomerate, pisolitic iron-ore and thin lignites. Some of these layers are full of leaves and fruits of terrestrial plants, with occasional insect-remains. According to the data collected by a Committee of the British Association, upward of thirty species of plants have been obtained, including conifers (*Cupressinoxylon*, *Taxodium*, *Sequoia*, *Pinus*), monocotyledons (*Phragmites*, *Poacites*, *Iris*), dicotyledons (*Salix*, *Populus*, *Alnus*, *Corylus*, *Quercus*, *Fagus* [?], *Platanus*, *Sassafras*, *Acer*, *Andromeda*, *Viburnum*, *Aralia*, *Nyssa*, *Magnolia*, *Rhamus*, *Juglans*, etc.)⁶⁷ In the west of Scotland the volcanic sheets attain still greater dimensions, reaching in Mull a thickness of 3000 feet, and there also including thin tuffs, leaf-beds, and coals. In Mull, Skye, and Antrim, the terraces of basalt, with occasional comparatively thin bands of tuff, form a noble example of the extravasation of great piles of lava without the formation of central cones or the discharge of much fragmentary matter (p. 437). They have been invaded by huge bosses of gabbro and of various granitoid rocks, which send veins into and alter the basalt. They are likewise traversed by veins of pitchstone, but more especially by prodigious numbers of basalt-dikes, which in Scotland have a prevalent W.N.W. and E.S.E. direction. The basalt-plain was channelled by rivers, and into the ravines thus eroded streams of pitchstone made their way (Scur of Eigg), whence it is evident that the volcanic eruptions lasted during a protracted period.⁶⁸

France.—In the Paris basin, where a perfect upward passage is traceable from Eocene into Oligocene beds, the latter are composed of the following subdivisions:⁶⁹

⁶⁷ W. H. Baily, *Brit. Assoc.* 1879, Rep. p. 162; 1880, p. 107; 1881, p. 152. On the north coast of Antrim, near Ballintoy, a band of tuff occurs about 150 feet thick. But in Ireland, as in Scotland, the tuffs take quite a subordinate place among the great piles of basalt.

⁶⁸ *Proc. Roy. Soc. Edin.* vi. 1867, p. 71; *Q. J. Geol. Soc.* xxvii. 1871, p. 280; *Trans. Roy. Soc. Edin.* xxxv. 1888, p. 21; *Q. J. Geol. Soc.* xlviii. 1892, Pres. Address, p. 162. Prof. Judd (op. cit. xxx. 1874, p. 220; xlv. 1889, p. 187), on the other hand, believes that there were five great volcanic cones in the Western Islands whence the streams of basalt flowed, and of which the mountains of Mull, Skye, etc., are the degraded ruins, and he regards the granitoid rocks as older than the others.

⁶⁹ Dollfus, *Bull. Soc. Geol. France*, 3e ser. vi. 1878, p. 293. The separation of an Oligocene series in the Paris basin is not admitted by many eminent French geologists.