

In the extreme south of France, between Toulon and Cannes, Permian rocks reappear, and, though occupying but a limited area, constitute some of the most picturesque features along the Mediterranean shores of the country. They consist of lower massive conglomerates, with intercalations of shale, containing *Walchia* and *Callipteris*, followed by shales, marls, red sandstones, and conglomerates. But their distinguishing feature is the enormous mass of volcanic materials associated with them. The lower conglomerates, besides their fragments of gneiss derived from the pre-Cambrian rocks of the district, contain abundant pieces of quartz-porphry, of which rock also there are massive sheets, which rise up into the well-known group of hills forming the Esterel between Cannes and Fréjus. Besides these acid outbursts in the older part of the formation, sheets of melaphyre are found in the upper part, while dikes of nodular felsite, pitchstone, and melaphyre traverse the series.<sup>260</sup>

Westward in the region of the Pyrenees, and in various parts of the Iberian peninsula, rocks believed to be Permian have been recognized. They frequently present thick masses of conglomerate, sometimes resting upon Carboniferous rocks, sometimes on formations of older date.

**Alps.**<sup>261</sup>—On both sides of the Alpine chain a zone of conglomerates and sandstones, which intervenes between the Trias and older rocks of the region, has been referred to the Permian system. The conglomerates (Verrucano conglomerate) are made up of the detritus of schistose rocks, porphyries, quartz, and other materials of the central core of the mountains. They sometimes contain sheets of porphyry, and occasionally, as at Botzen, they are replaced by vast masses of quartz-porphry and other volcanic rocks, with

series of "Études des Gîtes Minéraux," published by the Ministry of Public Works in France, particularly the volumes by Delafond on the Autun basin, and by Mouret on that of Brive; likewise the Memoirs by Grand' Eury already cited; Bergeron, "Étude Géologique du Massif au sud du Plateau Central," and Bull. Soc. Geol. France, 3 ser. vol. xvi. Reinach, Zeitsch. Deutsch. Geol. Ges. 1892, p. 23, gives a careful comparison of the French central plateau Permian rocks with those of the Saar and Nahe.

<sup>260</sup> F. Walleraut, "Étude Strat. Pétrog. des Maures et de l'Esterel," 1889. Carte Detail. Geol. France, Feuille d'Antibes.

<sup>261</sup> E. Suess, Sitzb. Akad. Wien. lvii. 1868, pp. 230, 763; G. Stache, Zeitsch. Deutsch. Geol. Ges. xxxvi. 1884, p. 367; Jahrb. k. k. Geol. Reichsanst. xxvii. 1877, p. 271, xxviii. 1878, p. 93 (giving the fauna of the Bellerophon Limestone); Verhand. k. k. Geol. Reichsanst. 1888, p. 320; E. Mojsisovics, "Die Dolomiterriffe von Südtirol und Venetien," 1879, chap. iii.; Fraas, "Scenerie der Alpen."