

noticed in a subsequent chapter. The Kimmeridge clay in the oolites also contains beds of shale impregnated with bitumen, which is used as fuel in a country where coal is extremely dear.

The wood-coal of Bovey Heathfield has been already noticed. I may state in addition that I visited the mine in 1815: it is worked like an open quarry; it had been for some years previously under water, but was then laid dry by pumps. There are several irregular beds of lignite or wood coal alternating with what is called dead coal, which is less inflammable, and resembles a bituminous shale; the beds wedge out narrow as they descend. The whole mass is more or less bituminized; but the upper part, which preserves the woody structure more perfectly, seems to be composed principally of clay. Sulphate and carbonate of iron occur in some part of the beds, and rounded pieces of maltha. Wood-coal occurs chiefly in diluvial deposits. Where wood-coal is covered with basalt, it is converted into a substance nearly resembling mineral coal. This coal occurs in Iceland, in the north of Ireland, and in many basaltic districts on the Continent.

Before concluding this brief account of imperfect coal formations, out of the limits of the regular coal formation, I would direct the attention of geologists to two situations, in which coal is found, that are well deserving of notice. The first is the mine of Entreveines, situated in a mountain valley about 2000 feet above the lake of Annecy, and at least 3500 feet above the level of the sea. The bed of coal consists of three minor beds, separated by thin seams of clay varying in thickness, yielding about four feet of good coal, which has the character and fracture of mineral coal; it is shining, does not soil the fingers, and is highly bituminous, being used exclusively for the gas lights in the cotton mills at Annecy. The total thickness of the sandstone, shale, and coal strata, which compose the coal formation in this place, is about one hundred and fifty yards; they are placed between thick beds of limestone, and dip together at an angle of about seventy degrees.* It is worthy of observation, that the limestone beds above and below the coal formation, have the hardness, fracture, translucency, and appearance of the transition limestone at Plymouth; yet in another part of the mountain, the same limestone is associated with a bed of dark clay, in which I found gryphites, and belemnites, clearly indicating that the bed was analogous to our lias or clunch clay; and that the limestone associated with it, notwithstanding its mineral character, belonged to the upper secondary strata; and hence that the coal, in geological position, agreed with the imperfect coal formations in the English oolites. Here, then, we have a further proof of what has before been stated, that in the cal-

* A particular description of this singular coal mine, with a cut, illustrating the position of the beds, is given in Vol. I. of my 'Travels in the Tarentaise,' &c.