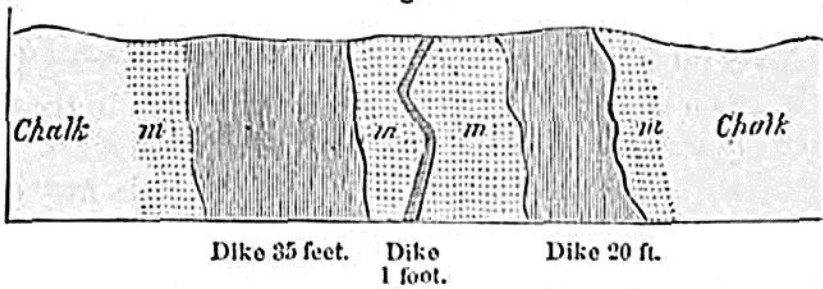


Fig. 631.



Basaltic dikes in chalk in island of Rathlin, Antrim.
Ground plan, as seen on the beach. (Conybeare and Buckland.*)

one. The entire contrast in the composition and color of the intrusive and invaded rocks, in these cases, renders the phenomena peculiarly clear and interesting.

Another of the dikes of the northeast of Ireland has converted a mass of red sandstone into hornstone. By another, the shale of the coal-measures has been indurated, assuming the character of flinty slate; and in another place the slate-clay of the Lias has been changed into flinty slate, which still retains numerous impressions of ammonites.†

It might have been anticipated that beds of coal would, from their combustible nature, be affected in an extraordinary degree by the contact of melted rock. Accordingly, one of the greenstone dikes of Antrim, on passing through a bed of coal, reduces it to a cinder for the space of 9 feet on each side.

At Cockfield Fell, in the north of England, a similar change is observed. Specimens taken at the distance of about 30 yards from the trap are not distinguishable from ordinary pit-coal; those nearer the dike are like cinders, and have all the character of coke; while those close to it are converted into a substance resembling soot.‡

As examples might be multiplied without end, I shall merely select one or two others, and then conclude. The rock of Stirling Castle is a calcareous sandstone, fractured and forcibly displaced by a mass of greenstone which has evidently invaded the strata in a melted state. The sandstone has been indurated, and has assumed a texture approaching to hornstone near the junction. In Arthur's Seat and Salisbury Crag, near Edinburgh, a sandstone which comes in contact with greenstone is converted into a jaspideous rock.

The secondary sandstones in Skye are converted into solid quartz in several places, where they come in contact with veins or masses of trap; and a bed of quartz, says Dr. MacCulloch, found near a mass of trap, among the coal strata of Fife, was in all probability a stratum of ordinary sandstone, having been subsequently indurated and turned into quartzite by the action of heat.§

But although strata in the neighborhood of dikes are thus altered in

* Geol. Trans. 1st series, vol. iii. p. 210 and plate 10.

† Ibid. p. 213; and Playfair, *Illust. of Hutt. Theory*, s. 253.

‡ Sedgwick, *Camb. Trans.* vol. ii. p. 37.

§ *Syst. of Geol.* vol. i. p. 206.