

cut through by horizontal drifts in four places. On each side of it, the *coal is converted into coak*, which on one side, in some places, was found to be 18 feet thick, and on the opposite side upwards of nine feet. A firm, hard, and unbroken vein of basalt, on an average about 13 feet thick, was in immediate contact with the coak on each side; and between these two veins, lay nodules of basalt and sandstone, upwards of nine feet in thickness, imbedded in a cement of blue slate.

At Walbottle Dean, five and a half miles west of Newcastle, below the bridge on the western road, a double vein of basalt (represented by Fig. 2, Pl. 4, of the 4th vol. of G. Trans.) crosses the ravine in a diagonal direction, passing nearly due east and west. It *hades or underlies* at an angle of 78 degrees, and cuts the coal-strata without altering their dip. On the eastern bank of the ravine, it is laid bare from the level of the brook to the height of about 60 feet. The northern and southern basaltic portions of the vein, the one five and the other six feet in thickness, are there 13 feet apart, and are separated from one another by a confused heap of fragments of sandstone and shale, broken from the coal-strata. With these fragments are found balls of basaltic tufa parting into concentric layers, and of a lightish brown colour; the balls are most abundant on the sides of the rubble near to the basalt. In a neighbouring colliery, both portions of the vein hold their course through the seam of coal, which is *charred* by their influence. This basalt contains nodules of quartz and chalcidony, but not adularia, which is abundant in the basalt of Coley hill.

A string of galena fills a crevice beside a vein of basalt about two miles beyond Durham.

A dyke called the Cockfield dyke, which is 17 feet wide, *hades or underlies* to the south, and throws up the coal-measures on that side 18 feet. The low main coal contiguous to the basalt, is only nine inches thick, but enlarges to six feet at the distance of 150 feet from it. The *coal is reduced to a cinder*, and the sulphur is sublimed from the pyrites near to the dyke.

A dyke is seen on the banks of the Tees a little below Yarm. It there passes into the newer red sandstone, and continuing its course in the same direction, is well known to traverse the north-eastern part of Yorkshire, near the still more recent formations of lias, and the sandstone of the inferior oolite, in the eastern Moorlands in its way to the German Ocean. This dyke is rendered highly interesting by its great length, and the proof it affords by thus penetrating later rocks, that it must have owed its origin to causes in action at a period long subsequent to the formation of the coal; a proof which yields a