ed by the drying or shrinking in of the rocks. This dyke in its course intersects very different formations, viz. the transition or metalliferous limestone, the coal district, and the upper secondary strata of lias and oolite. The different organic remains in these formations, as well as their position, prove that they were consolidated at distant periods of time. Indeed, the geologists who maintain that dykes were formed as before described, are ready to admit the distant eras of these formations. The transition or metalliferous limestone, and the lower strata must have been completely consolidated, long before the upper secondary strata were deposited; and the causes which might dispose the upper strata to shrink in, cannot be supposed to act on the lower rocks. It is also to be remarked, that in the lower rocks, situated to the west, the breadth of this dyke is more than twenty yards; but at Sillow Cross, where I measured it, it is not more than ten yards : this dyke must, therefore, become wider as it descends. It must also have been filled with basalt at the time of its formation, otherwise it would have contained numerous fragments of the rocks which it intersects.

The effects of this basaltic dyke on the different rocks through which it passes are truly deserving notice. When it comes in contact with limestone, the limestone is often found granular and crystalline, a fact the geological importance of which will be subsequently adverted to. Where it crosses the coal strata, and comes in contact with the seams of coal, the substance of the coal is for several feet converted into soot. At a greater distance from the basalt, the coal is reduced to a coke or cinder, which burns without smoke, and with a clear and durable heat. At the distance of fifty feet from the dyke, the coal is found in its natural unaltered state. It is particularly remarkable that the roof immediately over the coal is lined with bright crystals of sulphur. In some situations in the same county, the shale, in contiguity with basaltic dykes, is converted into flinty slate or jasper, and the sandstone is changed to a brick colour. There is another great basaltic dyke in the same district, which crosses the western extremity of Durham from Allenheads to Burtreeford on the river Tees, hence called the Burtreeford Dyke. It throws down the strata on the west side of it, one hundred and sixty yards.

Dykes, being generally impervious to water, they obstruct its passage along the porous strata, and occasion it to rise; hence it frequently happens that numerous springs make their appearance along the course of a dyke, by which it may be detected, when there is no other indication of it visible on the surface.

Basaltic dykes intersect both primary and secondary rocks, but they every where present indications of their action on the adjacent rocks. At Nigg, near Aberdeen, I examined a basaltic dyke on the coast, which intersects a rock composed of gneiss; the dyke is about thirty feet in width. Where the basalt is in contact with the gneiss, it becomes nearly compact, and approaches to the character