

clined; this is especially the case in the south-western counties, where they sometimes become perfectly vertical. They sometimes present inarched or saddle-shaped curvatures, the point of the arch being unbroken, which proves that the masses must have been to a certain degree soft and pliant when they assumed this form. Contortions are, as we have before observed, less usual in these more solid strata, than in the tender and yielding beds of the coal-measures; yet such sometimes occur, especially where the limestone beds are thin and alternate with shale. Instances may be seen on the southern coast of Pembrokehire.

Extensive faults traverse this formation.\*

When the beds of this limestone run thick, and are not separated from each other by argillaceous partings, it is often extremely difficult to ascertain its stratification, a rock of it under these circumstances often appearing at first sight as a vast unstratified mass: a careful examination will however generally detect the direction of the planes of stratification in some part of it; and when this clue is once obtained, and the eye is kept constantly directed to the face of the rock, in lines parallel to those planes, the stratified structure of the whole seldom fails to develop itself.

(h) *Agricultural character.* The elevated and exposed situation so generally occupied by this formation, has occasioned the greater part of the districts in which it prevails to remain in an uninclosed and unimproved state; and the surface, being generally covered with large rocky fragments, requires much labour to clear it. Mr. Farey observes that the rubble and debris on the limestone tract produce good pasture land when limed, without which great part of these lands would be covered with unproductive heath.

(i) *Phænomena of springs.* Where the beds of this limestone alternate with argillaceous strata, the latter throw out the waters in the usual manner; but where, as is more usually the case, the series consists exclusively of calcareous beds extending to a great depth, water is of very uncertain and irregu-

\* Some of these derangements appear to be of a magnitude which almost startles the imagination. At the foot of Ingleborough is a subsided mass of coal-measures at the base of the whole limestone series; a fault therefore seems to have taken place equal to the whole thickness of this series. Mr. Farey describes the western edge of the Derbyshire limestone tract as abutting against a similar fault which must exceed 900 feet. In Somersetshire, near Clevedon, a large tract of limestone covered with coal-measures appears to have subsided to such an extent, that at one end the strata of this tract crop out three miles to the west of the main chain to which they must have originally appertained. Undulations are probably combined with, and extend the effects of, the faults in some of these instances.