

markable effect : after this period, metallic veins have been rarely formed, for they seldom rise into the coal strata. The vegetable remains that are in the coal strata, appear principally to belong to plants that abound chiefly in tropical climates, as will be subsequently noticed. In no country have coal-measures been more extensively worked than in England, or the relations of the strata to the rocks above or below them been more fully examined.

Every coal district has its peculiar series of strata, unconnected with any other : there is a general resemblance in the nature of the different beds in each. A district, with its peculiar series of strata, is called a coal-field. The foundation rock on which the coal-fields of Derbyshire, Northumberland, Durham, Shropshire, and North and South Wales immediately rest, is the mountain and transition limestone, described in Chapter VII. In Nottinghamshire, Yorkshire, and Lancashire, the foundation rock has not been sunk to, nor does it rise to the surface ; but we have every reason to believe, that it is formed by a continuation of the same limestone, though this is by no means essential to a coal-field. In some parts of France, I have observed the coal strata resting upon granite ; being separated from it only by a thick bed of conglomerate. A general view of the arrangement of the Derbyshire coal-field may be taken as affording a type of the whole English coal-fields, with certain exceptions, which will be noticed.

The thick beds of mountain limestone (see Chap. VII.) which form entire mountains, decline in height towards the eastern side of the county, and are covered by the coal-measures. The lowest bed of these measures, or, to speak more correctly, the bed which separates the coal-measures from the limestone, partakes of a mixed character, varying from soft argillaceous shale to hard sandstone ; the prevailing color is a dark reddish or blackish brown. This bed has been called *limestone-shale* : its total thickness varies from five to six hundred feet, but in some situations is much less.

The harder strata of which this great bed is composed, are separated by soft beds that easily disintegrate and fall down ; they form the exposed face of Mam Tor, or the shivering mountain, near Castleton. The peculiar circumstance which renders this bed remarkable is, that though it contains chiefly vegetable remains, it contains also occasional patches or limited strata of dark bituminous limestone, with beds and nodules of ironstone, and thin seams of coal, which, however interesting they may be to the geological enquirer, are too inconsiderable to be worked. The next large bed, which is in some situations from three to four hundred feet in thickness, is composed chiefly of strata of hard siliceous sandstone, which is in some places coarse, containing angular fragments of quartz ; in other parts it is a fine grained and very durable stone. Some of the strata of this bed were formerly worked for millstones ; from which circumstance it received the name of Millstone Grit. It contains, as