

undulations and radiating striae. Large spheroidal masses of iron ore, weighing at least a ton, are thus found, in connection with the coal, at Ingleton, in Yorkshire; and in the coal fields of Staffordshire and South Wales, it is a well known form of aggregation. This structure also occurs in many other formations, as in the slate of Skiddaw, the lias, oolites, &c., though with considerable variations. It is usually called 'cone in cone,' 'cone coralloid,' conical limestone, conical ironstone, &c.

A different but yet closely allied phenomenon, noticed by Mr. Dillwyn in the substance of the coal of Swansea and other parts of South Wales, which we have also seen at Ingleton, is represented in *fig. 48*. Such a mass of coal, however solid, is found to separate not along a plane, parallel to the bed, but with deep hollows, and acute sinuous ridges, situated on their slopes, and undulated on their edges. The striations on the slopes are very similar to those on the conical ironstone; and though the differences are in other respects great, they both probably depend on some general law of concretionary action, modified in operation by the nature of the substances acted on: but we are quite ignorant of the circumstances which determine this peculiar structure in coal.

Succession and Thickness of Strata.

Considered in its greatest generality, and with reference to countries where the masses appear in the greatest simplicity (as in the south of England), the carboniferous system consists of three formations: viz. —

Coal formation.—A mass, 1000 yards or more in thickness, consisting of indefinite alternations of shales and sandstones of different kinds, with about 50 feet of coal in many beds, some ironstone layers, and (very rarely) thin layers of limestone.

Mountain limestone.—A mass of calcareous rocks, with very few partings of argillaceous matter, — almost no grits, — no coal, — some chert nodules, — and occasionally layers of red oxide of iron — 500 to 1500 feet in thickness.