shells, which shut close and have no opening (Producta); others are the closed chambers of cephalopodous shells (Orthoceras, &c.). Nor is it doubtful that many, if not all, the cracks and joints which, *near a metallic vein*, hold sulphuret of lead, or carbonate of copper, have been produced during the condensation of the stone, since we not uncommonly find them crossing and dividing the substance of shells and corals (Wensleydale) and fishes (Whitley quarry, near Cullercoats).

Upon the whole, therefore, whether the mineral substances occur in distinct regular *fissures*, occupy plane *joints*, lie in irregular *cracks* or holes of rock, or line secret hollows in *shells*—in all of these cases the existence of a cavity to receive the crystallised substances is demonstrated, as the most *ordinary* antecedent to the production of the mineral mass. It follows as a consequence, that *ordinarily*, when veins cross, and one passes through and divides the other, the "cross vein" is of later origin than that which is cut through. But as to the vein fissures having been originally *open* above or below, and as to the manner of their being filled, these points remain for further consideration.

## *Origin of Vein Fissures.*

The theory of the origin of veins being thus to a certain degree insulated from that of the rocks in which they lie, the next thing to be determined is the origin of the fissures in which the metallic and other mineral combinations have been effected. The fundamental facts for this inference are the prevalent parallelism of directions of the several systems of veins which, in a given district, belong to successive periods of formation; the penetration of these fissures through a great variety of rocks; their length on the surface (some extending even several miles); their depth, which in large veins exceeds the range of mining enterprise; the displacements of the rocks which they divide; their various intersections and mutual relations. It is obvious that