

All these limestones appear to contain the *Encrinurus*. Most of them also bivalve shells; and that called the Cockleshell limestone, oysters? of the diameter of four or five inches. They seem to agree together in every essential character, as well as in their extraneous and native fossils.

This formation is the great repository of the metallic veins of this district.

The fissures which contain lead ore in the mining district, are exactly similar to those described by Williams in his mineral kingdom. Such as range from north to south are called *cross veins*, or (occasionally) *dykes*; they are generally of great magnitude, and seldom carry ore; the most valuable mineral depositories are fissures from three to six feet wide, running for the most part from north-east to south-west, and cutting the cross veins; the cross veins being frequently rendered productive to some distance from the points of intersection.

The same vein is productive in different degrees at different depths, according to the bed which it traverses. Generally speaking, veins are most productive between the grindstone sill and the four-fathom limestone; none have been worked in Aldstone moor below the level of the Tyne bottom limestone; but the Dufton mines are situated in the lower beds, though none are worked in the Melmerby scar limestone.

The limestones are the chief depositories of ore, particularly that called the *great limestone*, which is considered to have produced as much lead as all the other sills together. Next to the limestones, the strata of sandstone called *hazles* are the most productive of ore; but the lead-bearing veins appear compressed between these hard sills. In Arkendale the sills of chert yield considerable quantities of galena, but this rock does not occur in the mining field further north. In shale the veins are comparatively barren, and in traversing these soft strata weak veins 'hade' considerably.

The hade of the veins is variable in degree, and in direction. When the veins in Weardale point east and west, they hade towards the south; but in Allendale and in the Aldstone moor country they generally hade towards the north: the strata are universally elevated on the side towards which the veins dip.

Veins, that are otherwise favourably circumstanced for producing ore, are more particularly so if the throw or alteration in the level of the beds of limestone, occasioned by the vein, does not exceed one or two fathoms: for then both cheeks of the veins correspond in their nature, and limestone does not become opposed to shale or any other barren stratum.

The beds above described forms the whole of the middle and lower regions of the escarpment of Cross Fell, extending