

The Swaledale Mining Field

The Swaledale area is formed from rocks of the Carboniferous system which belongs to the Yoredale Series and Milestone Grit.

The Yoredales are a group of strata that includes limestones, shales and sandstones layers which follow each other in repeated order, in total the Yoredale series of rocks is more than a thousand feet thick. Above them the sandstones of the Millstone Grit form the summits of many of the fells.

This thick strata contains many faults along which are vertical fractures, varying in length from very little to several hundred feet. Before the Carboniferous period there was a major intrusion of molten rock magma from deep within the earth. As the magma cooled, sulphides and minerals were squeezed out and escaped through the many fault lines and vertical fractures.



Gunnerside Gill

The chief ore of lead is **galena** (lead sulphide) and also present were calcite (calcium carbonate), barite (barium sulphate), witherite (barium carbonate) and fluorite (calcium fluoride) along with small quantities of copper and zinc. Galena is the ore from which metallic lead is produced by smelting and the other minerals are classed as **gangue**.

Ore was also occasionally deposited in lateral 'flats' or flots, where the minerals had penetrated sideways between the limestone beds into small caverns. As a general rule, mineral veins cut vertically through the strata, in contrast to coal seams which lie horizontally so parallel to the limestone strata they lie under. The coal seams do not cut into the rock but form a natural part of the succession of strata laid down. The Tan Hill area has been worked for centuries for coal extraction.

The mineral filling of a fault (or vein) varies greatly in both depth and lateral extent, and depends on so many different factors that mining was a very speculative activity. Ore shoots may be regular or swell to a large mass, then in other places quickly thin out to nothing or contain only gangue minerals. It is impossible to predict when this would happen, and key decisions had to be made if the miners should continue to work an area and hope they pick up another ore shoot, or abandon the workings and try elsewhere.

The Friarfold complex that runs along the northern side of Swaledale contains many good ore shoots for over ten miles and as a result this area has been worked intensively for hundreds of years. The area extends from west of Keld (Loanin Mine), through Beldi Hill and Swinnergill, across the top of Gunnerside Gill and Melbecks moor, eastwards to Arkengarthdale and continues over to Hurst. By the time it reaches Marske there are only a few small and scattered veins left.