



A WALK AROUND EAVES TOP QUARRIES, STAINLAND, TO LOOK AT THE ROCKS AND LANDSCAPES

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Bedding planes and joints in the Rough Rock
at one of the Eaves Top Quarries

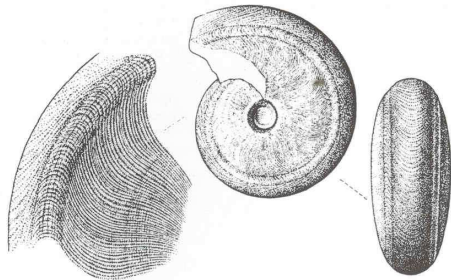
The rocks of the Stainland area are **Upper Carboniferous** (Marsdenian) in age, so they are about 310 million years old.

These rocks were laid down in **deltas** on the edge of a large continent, with mountains to the north and south. Sands and muds were deposited by rivers in shallow water. Because the continent was close to the equator, the climate was warm and wet so that tropical rain forest flourished. Dead plant material became trapped in stagnant swamps between river channels. Over geological time it was buried by muds and sands as the rivers in the delta changed position and building up more deposits. The water, oxygen and hydrogen were driven out of the plant remains, leaving only the carbon in coal seams.

After the sediments were formed close to sea-level, they were buried by hundreds of metres of sediment and compressed. As the sea water moved upwards it carried minerals which cemented the sand and mud grains together to make **sandstones** and **mudstones**.

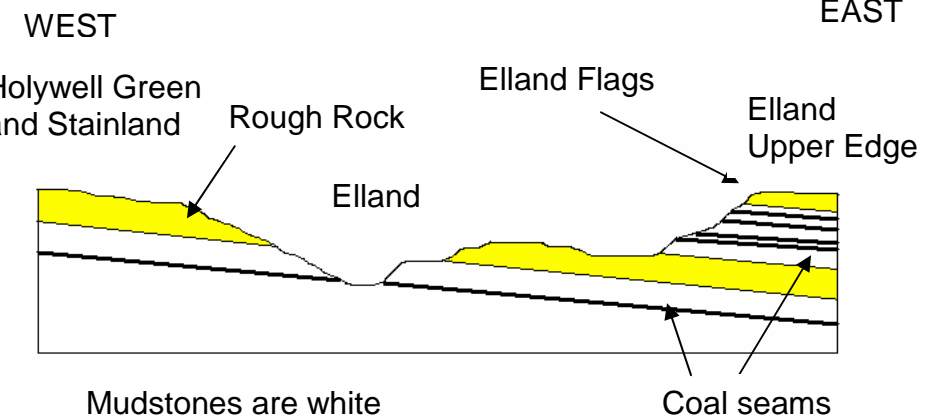
These rocks, particularly the mudstones, contain fossils, of which the most important are **goniatites**. There is a layer of mudstone below the Rough Rock which contains goniatites, as well as other fossils, such as shells and microfossils. It forms the slopes facing north below Eaves Top Quarries.

Goniatite



Goniatite - Reticuloceras bilingue x 1 1/2

The Holywell Green area, Norland Moor and Halifax itself, is underlain by a sandstone called the **Rough Rock**, which has been quarried widely. The Rough Rock is a thick bed of sandstone which forms many gently sloping plateaux in the Huddersfield and Halifax areas, including the slope on which the town of Halifax stands. It can be worked into an excellent building stone so has been widely quarried throughout West Yorkshire. It was recorded that in 1930 the quarry was standing (that is not working actively), but that the Rough Rock sandstones in this area were used for road setts and curbs.



Cross section to show the geology of the Elland area

The Rough Rock sandstone and the Elland Flags are more resistant than mudstones and they form the upland moors, while the mudstones are less resistant and are weathered and eroded more easily, so are exposed in the valleys.

This pattern of erosion on the sandstones and mudstones is common and gives West Yorkshire its characteristic landscapes of flatter moorlands formed by sandstones and steeper slopes formed by mudstones.