



A WALK AROUND GORPLEY CLOUGH, CALDERDALE, TO LOOK AT THE ROCKS, LANDSCAPES AND INDUSTRIAL HERITAGE

Grid Reference SD 914 233

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Sandstones form this steep cliff



The rocks of the Gorpley Clough area are **Upper Carboniferous** (Marsdenian) in age, so they are about 300 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 a rock.

There are three prominent **sandstones** in Gorpley Clough, the Gorpley Grit, Hazel Greave Grit and the Holcombe Brook Grit, which alternate with **mudstones**.

Gorpley Grit is the oldest and is about 25m thick in Gorpley Clough. It is described as a massive **grit** of varying degrees of coarseness and is overlain by a thin coal seam.

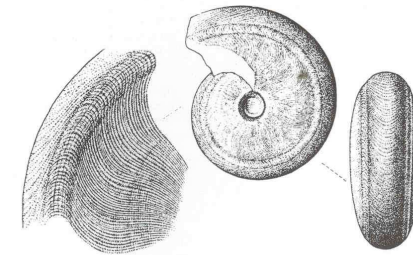
Hazel Greave Grit is described as being a fine-grained white rock which contains a high proportion of **quartz**. At Gorpley it is about 6m thick, and contains some thin layers of sandy muds. Generally present at the top of the grit is a **fireclay** horizon with a thin **coal**.

The Holcombe Brook Coal lies above the Holcombe Brook Grit and is reported to be up to 40cm thick in parts of Lancashire. The fireclay under the coal may have been more important economically than the coal and was mined in

Portsmouth on the other side of Todmorden Moor and used to make sanitary and glazed ware.

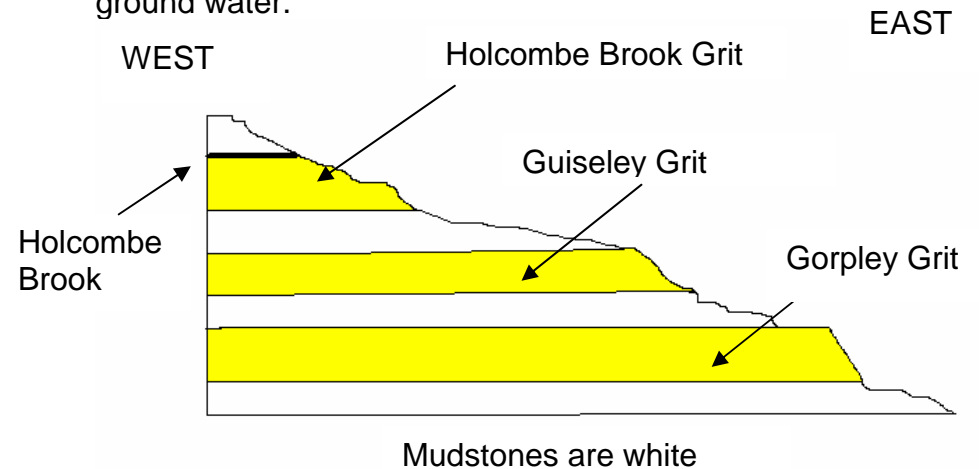
These rocks, particularly the mudstones, contain fossils, of which the most important are goniatites. There are three layers of mudstone which contain goniatites between the sandstones, as well as other fossils, such as shells and microfossils.

Goniatite



Goniatite - Reticuloceras bilingue x 1 1/2

The waterfall at SD 915 235 has an extensive formation of tufa along the north side of the plunge pool. The tufa is thought to be precipitated from calcium carbonate in the ground water.



The three sandstones are more resistant and form the waterfalls, while the mudstones are less resistant and are weathered and eroded more easily.

Cross section to show the geology of Gorpley Clough