

The rocks of the Brockholes area are **Upper Carboniferous** (Langsettian) 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 built up more deposits. The water, oxygen and hydrogen were driven out of the plant remains, leaving only the carbon in **coal seams**.

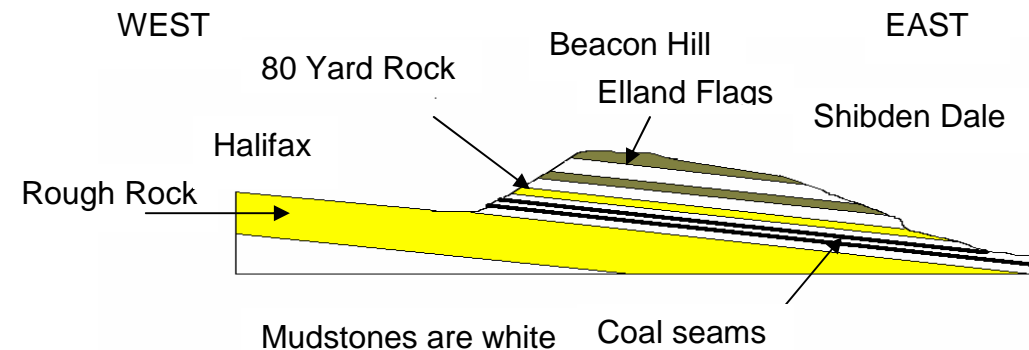
After the sediments were formed close to sea-level, they were buried by hundreds of metres of sediment and **compressed**. As the sea water moved upwards it carried minerals which **cemented** the sand and mud grains together to make **sandstones** and **mudstones**.

Most of Halifax is built on yellow sandstone called the **Rough Rock**, which slopes gently from west to east. It can be worked into an excellent building stone so has been widely quarried throughout West Yorkshire. The **Elland Flags**, which have a green/grey colour, have also been exploited widely, particularly in the Northowram, Southowram and Hipperholme areas. They were used for flagstone and roofing slates, as the bedding planes are close together so the rock splits evenly.

There are several coal seams which have been exploited in the Beacon Hill and Shibden Dale areas, probably for several hundred years. They are all less than 1m thick, so became uneconomic. There are many **coal pits** in this area, which

are recorded on maps and in place names. Sometimes there is still evidence of disturbed ground or a **shaft top**.

Adits (tunnels) can be seen in Godley Cutting, where the 36 Yard Coal outcrops. The ventilation chimney and furnace above Cunnery Wood, built in the 1820s, is a scheduled ancient monument. Mudstone layers were quarried for bricks in several places, including the large quarry at Brierley Hill.



Cross section to show the geology of the Beacon Hill area

The **landscape** of West Yorkshire is largely controlled by underlying geology. The Rough Rock is a thick, resistant bed of sandstone which forms many gently sloping plateaux in the Huddersfield and Halifax areas. The mudstones are less resistant and are weathered and eroded more easily, so are exposed in cloughs and valleys.

This pattern of erosion of 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.