



A WALK AROUND ROYDS HALL
BECK, JUDY WOODS,
BRADFORD, TO LOOK AT THE
ROCKS, LANDSCAPES AND
INDUSTRIAL HERITAGE
Grid Reference SE 143 272

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Clifton Rock sandstone forms this cliff, which was probably a quarry.

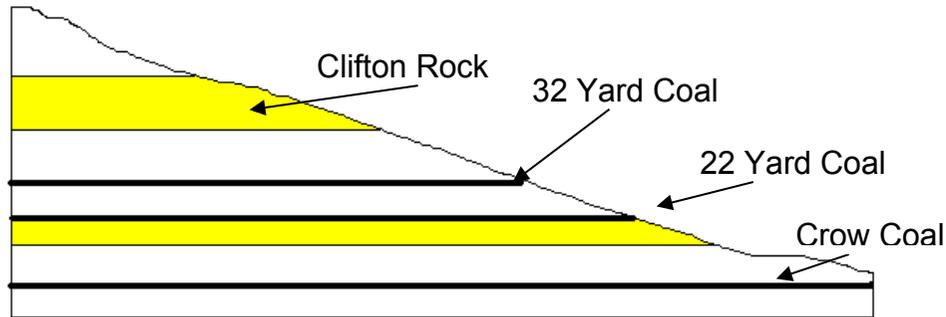


Waterfall where the beck crosses the more resistant rock

The rocks of the Bradford area are Coal Measures of **Upper Carboniferous** age, so they are about 310 million years old.

NORTH WEST

SOUTH EAST



Mudstones are white
Sandstones are yellow

The beds dip gently to the south east but taking a straight line down the beck, they would appear horizontal.

Sketch cross section to show the geology down Royds Hall Beck

These rocks were laid down on the tops of **deltas** and floodplains of very large rivers 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 the carbon in **coal seams**.

The coal seams are generally underlain by a **fireclay**. This is a layer of pale sticky clay, which is the clay soil in which the plants grew. It is called a fireclay because it has properties which allowed it to be made into firebricks for furnaces and coal fires. It gave rise to local brick manufacture.

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. Sandy sediment makes **sandstones** (often called grits if the sand grains are angular) and muddy sediments gives **mudstones**. The sandstones are more resistant and form small waterfalls, while the mudstones are less resistant and are weathered and eroded more easily.

These rocks, particularly the mudstones, contain **fossils**, of which the most important are **bivalves** (shells) and **plant fossils**. The plant fossils range from large tree branches and roots, often found in sandstones, to delicate leaves and needles in the mudstones. Mudstones contain **plant spores** which are microscopic and tell geologists about the environment in which the sediments were deposited, as plants are very sensitive to temperatures and soil type. Mudstones are generally rich in iron and, as the muds were cemented, the iron formed into very rich **iron nodules**, which have been used as a basis of iron and steel manufacture, particularly in this area of Bradford. The coal seams were first exploited by **bell-pits**, the remains of which can be seen in Judy Woods in several places. Later, **deep mining** became possible and there are many old shafts and tunnels in this area, with spoil tips and inclined planes seen on the surface. Place names often give a clue to the location of industrial remains.