



A WALK AROUND UPTON TO LOOK AT THE ROCKS, LANDSCAPES AND INDUSTRIAL HERITAGE

Grid Reference SE 480 132

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Permian dolostones at the top of Upton Cutting



Carboniferous clays, sands and mudstones below the dolostones

The rocks of the Upton area are **Carboniferous** and **Permian** in age, so they are about 290 to 270 million years old. The oldest rocks, the Carboniferous Coal Measures, are at the base and the younger Permian rocks lie on top of them and are therefore a bit younger. Between the two periods there was a short time when this area of Yorkshire was uplifted because of plate collision to make the Pennine fold. So the older Coal Measures were weathered and eroded before the younger Permian rocks were laid above. There is a gap in time, called an **unconformity**, between the two. We have found this unconformity by excavating in Upton Cutting.

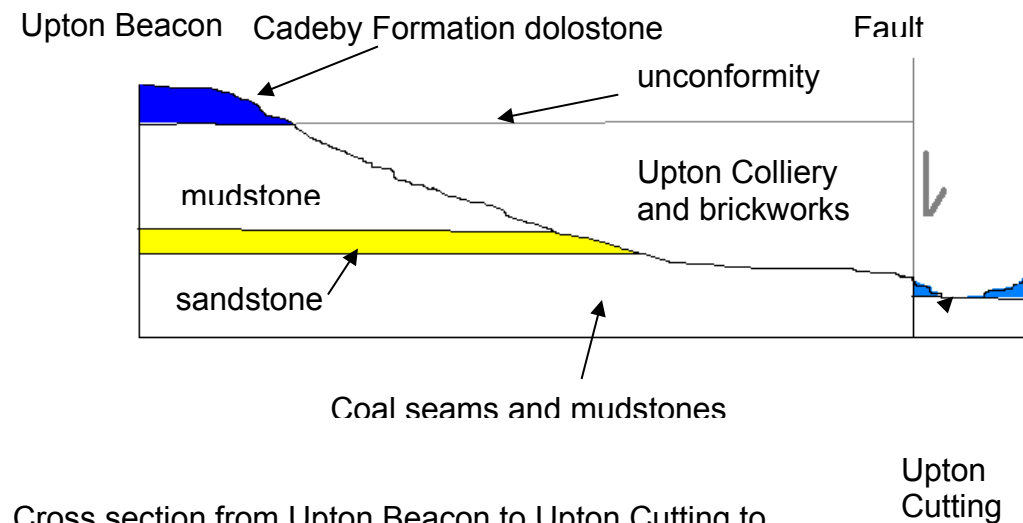
The Carboniferous Coal Measures are mainly made of **mudstones**, but also contain **sandstones** and **coal seams**. Upton Colliery exploited the coal seams, particularly the Upton Coal. These rocks were laid down in **deltas** on the edge of a large continent, with mountains to the north and south. Sands and muds were deposited 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**.

The coal gave rise to the mining industry in Upton, the sandstones are using for building and the mudstones were used for brick-making at the Colliery site.

The Permian Cadeby Formation (which is a **dolostone** with the mineral **dolomite** giving it a yellow colour) was laid down on the edge of a shallow sea in desert conditions. The continent had drifted northwards and lay in tropical latitudes

so the climate was hot and arid. The **Zechstein Sea** was a small part of the great Tethys Ocean, which lay between Eurasia and Africa. The sea was hot and salty and evaporated in the arid climate, leaving calcium carbonate behind. This limey mud was buried by other sediments later, so that the water was driven out and it was cemented by a magnesium-rich water and became a hard rock. The magnesium mineral is called **dolomite** and crystals of it are sometimes found in the **vugs** (little holes) in the limestone. The Cadeby dolostone is an excellent stone for road aggregate and has been used in building houses and walls wherever it is found.

There is a **geological fault** running close to Upton which has faulted the Cadeby Formation down so that it is found in the railway cuttings as well as on the top of Upton Beacon, as the section below shows.



Cross section from Upton Beacon to Upton Cutting to show the geology