



Geology at Alderley Edge

North of the Cheshire Plain, Alderley Edge is a north facing escarpment of red sandstone and mineralised rock rising 190 metres above sea level.

It is a site of unique geological importance in Britain for the non-ferrous (non-iron) ores that occur among its sediments. Extensive disused mine workings at Alderley Edge mean that the sedimentary rocks in which these minerals can be found are easily accessed and studied. The mine system ensures that the ores and their relationship to their host rocks remain protected.

For these reasons Alderley Edge has been selected as a Regionally Important Geological Site (RIGS) and designated as a Geological Conservation Review Site. It is also a Site of Special Scientific Interest (SSSI for geological reasons.

Structure of Alderley Edge

Alderley Edge is largely made up of sandstone – a sedimentary rock that was formed during the Triassic Period –

approximately 230 million years ago. 'Sedimentary' rock is one that has been formed by the accumulation and consolidation of minerals, deposited (in this case) by wind and wafer.

At Alderley Edge, the sandstones dip from the Edge towards the Congleton Road (A34) at approximately 12° to the horizontal. The sandstone is a series of layers or 'beds' many metres thick. Each layer is slightly different in origin, hardness and colour. The sequence of rocks at Alderley Edge is, from newest to oldest, as follows:

newest

- Helsby Sandstone (West and Wood Mines, upper part of Engine Vein)
- Wilmslow Sandstone (lower part of Engine Vein)

oldest

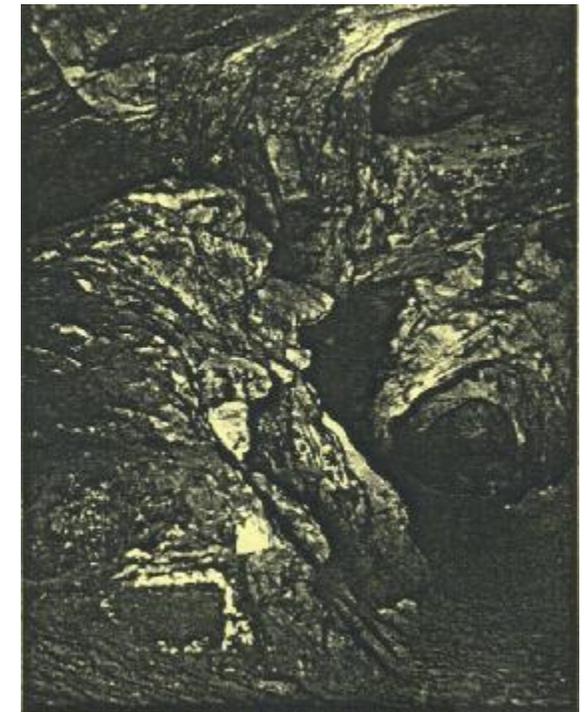
Alderley Edge itself exists because of an uplift of a block of sandstone. This sandstone is hard and resists erosion and thus the uplifted block stands above the surrounding plain.

Helsby Sandstone is a bright red brown variegated with greenish bands and is formed from sandy sediments laid down by streams and rivers. In addition, some of this sandstone may have formed by the build up of sand dunes, blown by the wind. Within the Helsby Sandstone, there is also conglomerate – a sedimentary rock composed of rounded pebbles and sand laid down by meandering streams and

rivers which formed part of a delta system.

Wilmslow Sandstone consists of bands of clay found in layers between other beds of rock. This clay was utilised in the past, amongst other things, in fields as a soil conditioner. Flooded marl pits are an important wetland habitat in Cheshire.

Marl, elsewhere in Cheshire, contains thick beds of rock salt and was laid down in a sea with a high salt content.



Above: The Lion Chamber in West Mine illustrates the layering of the rock under the Edge.

Mineralisation

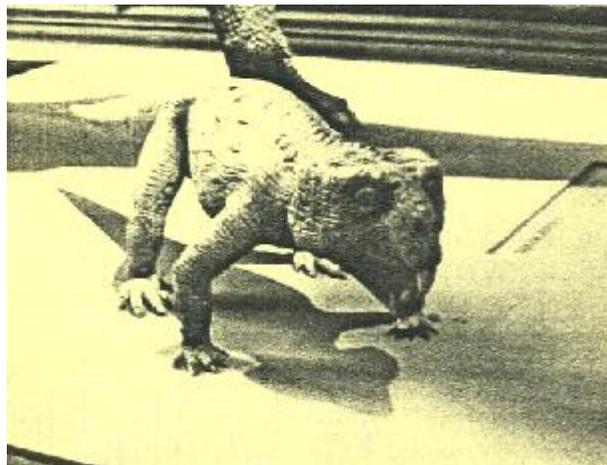
The mineralisation of non-ferrous ores occurs throughout the fault lines at Alderley Edge and the surrounding sandstone.

Traces of metals were transported in solution from the rocks lying underneath the Cheshire Basin. These solutions were then trapped in the faults by clay bands and deposited as mineral ores. The main ores found here are copper and lead but also smaller quantities of: zinc, arsenic, cobalt, nickel, antimony, silver and gold.

The Early Life of Alderley Edge

The Triassic period in Britain was hot and dry. The rivers which carried the sediment that formed the Upper Mottled and Keuper sandstones may have been irregular or seasonal in flow. Plants and animals were scarce in this unfavourable environment and so fossils are rare in the Triassic rocks of Alderley Edge. However, the following evidence of life has been found

- 3-toed reptilian footprint in the Engine Vein Conglomerates at Castle Rock
- *Euestheria minuta* (clam shrimp) fossils found at Engine Vein Mine
- *Euestheria minuta* fossils and an insect wing fossil found in the lower part of Keuper Marl near Styal, 4m North West of Alderley Edge.
- *Rhynchosaurides* footprint from the Wood Mine conglomerate formation



Above: Reconstruction of the herbivorous lizard-like *Rhynchosaur*



THE NATIONAL TRUST

The Manchester Museum and the National Trust set up the Alderley Edge Landscape Project in 1996, was a multidisciplinary research project combining archaeology, geology, history, literature and botany. Check out the website on: www.alderleyedge.man.ac.uk

The Derbyshire Caving Club maintain the mines under Alderley Edge and hold open weekends twice a year for the public to be able to experience the mines first hand. More information can be found on: www.derbysCC.org.uk

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