MWGG (Yorkshire) Field Trip 20 July 2016

Dry Rigg Quarry and Langcliffe Hoffman Kiln

Our trip to Helwith Bridge held us in trepidation as black clouds and thunder claps escorted us. On arrival we were informed by Mik Cardus of Tarmac that lightning had struck the plant and electricity was off!! This was quickly resolved in this case and Mik and Dr David Johnson – our guide for the day – gave an introduction on the history and output of the plant which now focussed on high end 65PSV – high skid resistance- material of varying sizes for road construction surfaces.

John Williams gave a short presentation on the geology of the site pointing out that Dry Rigg is within the Horton Formation of the Ludlow Epoch of the Silurian Period being formed 426mya in deep water turbidic conditions within Avalonia which was at 30 deg South. This was folded and eroded during the Devonian forming a large syncline locally and is now capped on Maughton Scar above by Kilnsey, Cove and Golddale Great Scar Limestone which gives a 344my unconformity. The North Craven Fault lies half a mile south of here which has resulted in inliers of Silurian and Ordovician rocks in this area which have been quarried for many centuries along with the local limestone.

Now in bright blue skies we walked down the quarry and we were first shown the crushing and sorting plant being operated by one man in a central control room. As Arcow Quarry was currently closed but now had the facility of a railway link – some material was being diverted to that system.

We could see the very steep 70-degree northerly dip of the Greywack to our south which displayed parallel veins of quartz and spectacular clasts and ripple marks in places. In front the many stepped levels of the quarry clearly showed the same dip to the north. On leaving the quarry we were shown some loose rocks with graptolite fossils for our particular interest.

On the way to the south observation point we pass a restoration area – now a wildlife haven with lake and marginal plants which is what Dry Rigg would become on a much larger scale when abstraction is ended. The wall to our right showed many examples of clasts, pyrite and barites which had been taken from earlier excavations at the quarry.
At the observation point David Johnson explained the very informative board and showed us that the quarry face demonstrated a drag fold being part of the major syncline in the Horton Formation. To end our morning we visited the adjacent Newfield Crags which is a spectacular demonstration of multi flow patterns with large flute marks indicating that the flows were from the south west. As rain looked imminent some took lunch at the reception room whilst some drove to the large car park at Langcliffe Quarry.

We all met again at 2.00 at Langcliffe Quarry which was now unused and the deeper sections had been filled by Craven Council. The quarry here – being we have crossed the North Craven Fault with it’s 300m throw to the south - is in Cove Limestone with a little Gordale Limestone at the top. Unlike Dry Rigg there are no stepped levels for safety so this is a magnet for rock climbers. Our purpose here is not however the quarry but the **Hoffman Kiln** being the largest and best preserved continuous process kiln in the country.

The kiln went into full production in 1873. The Craven Hoffmann originally had 16 firing chambers and a partial roof but major alterations after 1895 saw the roof removed, the water-balance hoist re-jigged, the number of chambers increased to 22 giving a kiln 244m long, and the flue system altered to improve efficiency. The Hoffmann worked continuously until September 1931 when it was shut down. A surge in demand for agricultural lime saw the Hoffmann being re-commissioned in November 1937 but only on one fire: it was shut down for good in 1939.

David gave us a full and comprehensive explanation of how the kiln was operated based on his research and a fascinating insight of the work involved by speaking to workers who had undertaken work there. It was very hard work to quarry the limestone, transport to the kiln, stack the blocks and seal off the sections before the fire which was fed with a small quantity of coal came around again. Two fires circulated. The lime was moved directly from the kiln to a rail line connected to the Midland Settle Carlisle railway. The lime was used for agriculture, mortar, textiles, tanning and paper making.

The **triple vertical kilns** were constructed by Murgatroyd based on old-fashioned technology erecting his battery of three masonry-built vertical kilns which essentially were larger versions of the traditional field kiln. Stone was brought by a level narrow-gauge tramway from his quarry, and fuel was hauled up an incline from his rail siding below – both were tipped into the bowls at the top. The quarry also sent out crushed stone. Lime was drawn out of the base of the kilns at the far end of each bowl’s tunnel and barrowed to waiting rail wagons.
Expansion in the early 1900s saw them erect twin steel-clad kilns built on the 1900 Spencer patent but this was short lived.

It is clear that this site could be a valuable and popular museum if adequate funds were available.

With thanks to Dr David Johnson and Mik Cardus of Tarmac for a valuable day.

Further reading