MFS outing to Tan-y-Foel Quarry

On 9th September, 36 Field Society members visited the uplands of Cefn Coch on a rather blustery and threatening Autumn day. The main focus of the visit was the geology of Tan-y-Foel Quarry, operated by HV Bowen and Son, and as it was a busy working weekday, we were all suitably attired in high-viz garments. In a brief introduction to the site by Mark Bowen, he explained how his family have been extracting stone from the quarry since the 1940's.

We were delighted that Bill Bagley, who gave a fascinating talk on the 'Geology of Mid-Wales' to MFS in 2013, agreed to join us at Tan-y-Foel, a quarry with which he is very familiar. Using photos and diagrams, and competing with the noise of quarry vehicles, he outlined the background geology of the Welsh basin and described how the area around Cefn Coch fits into the overall picture. Tan Y Foel Quarry provides the thickest continuously exposed section through the Wenlock sandstone-dominated mid Silurian sedimentary deposits in Wales. These were laid down some 480 million years ago, when much of the Earth's continental landmass existed as two large continents, Gondwana and Laurentia, separated by 7,000 km of ocean. What is now the UK was separated between them – the north of Scotland on Laurentia, and the rest on Gondwana**.** Later, around 400 million years ago, the Caledonian Orogeny occurred, a collision of tectonic plates which allowed Scotland to join the rest of the UK. This event also resulted in the sediments around Cefn Coch being tipped from the horizontal to the vertical plane, as was clearly visible to us all as we explored the quarry.

As we walked up to a quieter area, we were fascinated by the spectacular vertical layers of sandstone, reaching several metres in thickness, interlayered with thinner bedded siltstone and mudstone. These sedimentary rocks are classified mainly by grain size, the weaker, finer grained rock being used for general aggregate in the construction industry. The high PSV (polished stone value) of the stronger, coarser stone makes it ideal for giving good skid resistance, and it is therefore much sought after for use in high quality specialist road surfacing.

We were all struck by the awe-inspiring vastness of the rock faces, which varied considerably. A huge vertical bed, which was once the upper surface of sedimentary deposits on the sea-bed, displayed a somewhat arty, sculptured appearance, owing to what Bill explained were concretions. Concretions are hard bodies that form in sediments before they become sedimentary rocks, when minerals come out of the groundwater and cement the sediment together. They looked rather like huge cobbles within the rock.

As we turned on the spot through 90 degrees, we faced a rock face where quarrying operations have exposed a cross-section of the vertical bands of sediment. These varied in colour and thickness, and included bands of ash and bentonite within the sandstone. Perhaps the most admired features here were the Liesegang rings - rust-coloured bands in concentric ring-like arrangements, cutting across the bedding layers and forming repeating circular patterns which varied in size according to the width of each band. Our cameras were certainly well-used at this point.

The only fossils to be found here, are graptolytes, but none were found on this occasion. We did see ripple marks though, which are evidence of the rocks once having been part of the seabed.

Although the quarry environment might have seemed an unlikely place for very much of botanical interest, Ruth and Gill each made good plant lists. We were interested to see that the dominant species was Coltsfoot (Tussilago farfara), which colonised virtually every spoil heap and stony roadside area. Two specimens of White Melilot grew at the base of a spoil pile, and other plants of interest included Thyme-leaved Sandwort (Arenaria serpyllifolia), Sand Spurrey (Spergularia rubra) and Procumbent Pearlwort (Sagina procumbens). (Full plant list in centre page section).

As the weather deteriorated, and the rain wetted us ever more thoroughly, most people headed for Llanllugan, and the shelter of St Mary's Church. This is the last surviving example in Wales of an abbey attached to a

Cistercian nunnery, and houses a famous church organ built for William Gladstone, as well as a dedication to William Lort, an eminent naturalist, surgeon and doctor in his time (1823-1891). The building dates almost entirely to the late fourteenth and fifteenth centuries, and its late medieval roof structure remains, together with much original fifteenth century stained glass in the east window. Opposite the church we noted the interesting preaching stone, used by the revivalist Hywel Harries in about 1760, and the nearby baptism pool.

As the rain continued, we were all delighted to retire to the warmth and hospitality of the Cefn Coch Inn, where Menna Watkin plied us with endless cups of tea, and a splendid array of sandwiches, scones and home-made cakes.

Sue and Steve Southam