ON THE EDGE

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Early in 2007, friends who run bric-a-brac stalls for a charity in Cleethorpes gave me a book titled " The Old Houses of Wenlock" by H.E. Forrest, published in 1915. After thumbing through the book , I realised that, although we had bypassed Much Wenlock in Shropshire on many occasions as we passed through to North Wales, we had not visited the town. The book strongly indicated that there were a lot of interesting old buildings to see. So, we decided to stay near the town to visit it and the surrounding area. I also realised that, in spite of my long interest in the Silurian System and being familiar with the Wenlock Series through my association with the Tortworth Inlier, I had not visited the area except very briefly one Sunday morning in the 1980s on a field weekend with Dr. (now Professor) Mike Bassett of the National Museum of Wales. Considering that Wenlock Edge is the type locality for the Wenlock Limestone, with superb fossil and geo-morphological features, this was a significant omission.

At the end of April 2007, we took our caravan to a site near Much Wenlock, about half a mile south-east of Wenlock Edge. On our first day, we drove south-west along the Edge to Westhope from where we walked along the scarp for about 2 miles. Through the trees, bursting into leaf, we could see the lower ground to the north-west, Ape Dale, formed in the Wenlock Shales which then rose up the scarp towards us, protected by the overlying Much Wenlock Limestone. All the bedding dips south-east at about 10° - 15° so that the Limestone we were walking on underlies the next in the sequence, the Ludlow Shales which form another sweep of lower ground. After walking the 2 miles, we turned south-east and went downslope over the Ludlow Shales of Hope Dale. Rising in front of us and topped by the early Victorian folly of Flounder's Tower, *(photo 1)* was Callow Hill, formed from the next bed in the sequence, the Aymestry Limestone. Built by the engineer and entrepreneurial industrialist Benjamin Flounder in 1838, it had fallen derelict and has now been restored by a Trust formed to preserve it in excellent condition. Having reached the lowest point of the Ludlow Shales, we climbed gently at first but the gradient became increasingly steep until, for the last 100 yards or so, it was about 1 in 2! It was worth the climb. There, spread out before us from east to west, was the equivalent of a geology teacher's dream. The topography vividly displayed the underlying geology - almost parallel tracts of differing ground running SW - NE with the higher levels marking the limestones, and capped by trees, and the lower ground, ploughed and pasture, showing where the softer shales lay. From our vantage point on the Aymestry Limestone of Callow Hill,we could see in the distance (about 7 miles to the NW) the high ground of Long Mynd, at its highest point 516 metres (1700 feet) formed from the Longmyndian Super Group of unaltered Precambrian sandstones, shales and conglomerates (570 ma). Closer to us were the lower ground of Caer Caradoc (459 metres, 1515 feet) and The Lawley, both formed from Precambrian Uriconian volcanics - lavas and ashes erupted from rhyolitic volcanoes about 566 ma. Crucially, hidden from our view, was the most important feature of the geology in the area. Between the high ground of Long Mynd and the slightly lower hills of Caer Caradoc lies the Church Stretton valley, along the SE side of which and on the NW side of Caer Caradoc and The Lawley, is the Church Stretton Fault. This fault, along with the Pontesford Lineament to the north-west of Long Mynd, has had a profound effect on the geology of the Welsh Marches, having moved lengthwise at various times and directions over 500 million years. Indeed, it is now interpreted as the boundary between blocks of crust (terranes) which have moved laterally long distances along the fault line. There has also been an estimated downthrow of the rocks to the north west of 1100 metres.

Photo 1: Flounder's Folly, Callow Hill

On our side of the Uriconian volcanics of Caer Caradoc, we could see about 2 miles of lower-lying land, dipping slightly SE and composed of a sequence of Ordovician mudstones, siltstones and sandstones. About 1 mile NW of Wenlock Edge, Silurian sediments, the Purple (Hughley) Shales and then the Wenlock Shales take over unconformably from the Ordovician. As the Edge is approached, the shales rise up the scarp, protected by the harder overlying Wenlock Limestone, itself marked by the prominent line of woodland which stretches for much of its length from Ironbridge to Craven Arms, a distance of 17 miles. The classic scarp and dip/vale topography was laid out in front of us as parallel strips of land varying in colour and composition.

Photo 2: Aerial View of Wenlock Edge

Ridge and Vale Scenery
This simplified section shows the rocks that make up Wenlock Edge. Two tilted beds of hard limestone form the parallel escarpments of Wenlock Edge and View Edge, while the alternating layers of softer shale have eroded to create the gentle vales of Ape, Hope and Corve Dale.

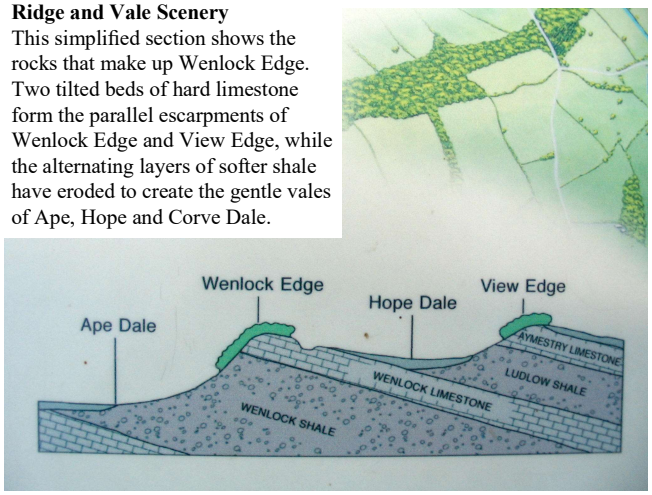

Photo 3: Cross-section of the Wenlock Rocks

To cap this classic geological vista *(photos 2 and 3)* was the tower of Benjamin Flounder which had been built from Aymestry Limestone and displaying fossil corals, bryozoans and fragments of brachiopods embedded in the grey silty flags. Harder limestone blocks can also be seen in the masonry. Returning on the lower footpath, a few specimens of the large brachiopod, *Kirkidium knightii,* lay on the surface.

Wenlock Edge is formed from the Wenlock Limestone and has been the dominant feature of the landscape for a very long time, being used for building stone, lime production and as a flux for iron smelting, particularly in the early days of the industrial revolution when Coalbrookdale was the world centre of iron production. The limestone was laid down 420 million years ago about 30 degrees south of the equator in a shallow tropical sea which, for much of the time, was clear, ideal for the growth of corals, stromatoporoids *(photo 4)* and crinoid colonies. Indeed, these colonial creatures were so abundant that they formed patch reefs on the sea floor. At intervals, the growth was slowed or even killed off by falls of bentonite (volcanic ash) from distant volcanoes (D.C. Ray 2007.) Short periods of much increased sedimentation from tectonic movements, causing uplift of land bordering the sea and resulting in increased erosion, also had the same effect. This feature is much more in evidence in the SW half of Wenlock Edge where the colonial fauna are not found but greater levels of silt and sand are present in the rocks.

Photo 4: Stromatoporoid

Using the book which had prompted our visit, we now paid visits to Much Wenlock to look at the building stones. The oldest building in the town is the Chapter House *(photo 5)* of the Priory which dates from 1086 and is built with Much Wenlock Limestone. The tracery is carved in a harder siliceous sandstone and still displays the intricate patterns carved 920 years ago. Elsewhere in the town, the Limestone is much in evidence - the parish church, dating from the Norman period, the Old Prison which is the only stone portion of, and predates, the half-timbered Guildhall of 1577. At the crossroads in the centre of the town is a modern memorial *(photo 6)* built with dressed stone containing corals and stromatoporoids. In a wall near St. Owen's Well a block was full of fossil corals *(photo 7).*

Everywhere around the town and the surrounding area, the Much Wenlock Limestone is the dominant building stone. So, time now to visit some of the quarries that have produced the stone for hundreds of years.

Quite fortuitously, the Shropshire Geological Society has just published a series of geological trails of which one is on Wenlock Edge. The leaflet contains two short walks which visit old quarries where the geology can be examined using the information in the leaflet. We went to

Photo 5: The Chapter House, Much Wenlock Priory

Photo 6: Coral and Stromatoporoids, Memorial wall

Photo 7: Fossil corals in a wall, Much Wenlock

two of the sites listed, Edgefield and Knowle quarries. The first is about 1km from Much Wenlock and was working well before 1802, when Thomas Telford constructed a winched tramway at about 1 in 4 to the bottom of the Edge. Knowle Quarry displays very similar features to Edgefield Quarry but they are very much clearer. Two things stand out - the frequent occurrence of "ballstones", *(photo 8)* which is the local quarrymen's name for patch reefs (bioherms) formed from corals, stromatoporoids and bryozoans, and the narrow beds of flaggy limestone separated by thinner bands of softer shales. The most interesting point is the relationship between the reefs and the stratified limestone - as the limestone beds were sedimented over the reefs, so they were arched upwards over the tops, which can be seen clearly in the *photo 9* taken in Knowle quarry. Also, in both quarries, thicker, soft bands are weathered into distinct clefts marking the level at which an ash fall (bentonite) from a distant volcano occurred, *photo 10.*

Photo 8: Large ballstone (reef) at Knowle Quarry

Photo 9: Bedding curving over patch reef, Knowle Quarry

From the old Knowle quarry, which worked from before 1770 to 1927, a footpath now runs along the top of the Edge, along the NW lip of the huge working Lea Quarry. In its face we could see ballstones (bioherm reefs), but as we walked further, the best was to come. Lining the path, many large bioherms could be examined closely and fossils collected from the talus alongside the path, all demonstrating the characteristics which make Wenlock Limestone and its unique manifestation, Wenlock Edge, so famous. As we found in the buildings of the area, the nodular flaggy limestone seen in the cliffs and quarries imparts its character into the manmade landscape from the

Photo 10: Bentonite Cleft at Edgefield Quarry

earliest building still in existence right up to the most modern.

If you have never been to Shropshire, go and experience the geology and soak up the beauty and variety of the landscape - walk over the rolling heather hills of Long Mynd, lose yourself in the woods of Wenlock Edge, treat yourself to the geology teacher's dream from Flounder's Folly on Callow Hill. But make sure you visit Much Wenlock first and pick up the geological trail leaflet from the town's museum. If you fancy a more strenuous walk, climb The Wrekin and survey the landscape and geology from this superb viewpoint (a Shropshire Geological Society leaflet is also available).

Coincidentally and unfortunately after our visit, The Proceedings of the Geologists' Association published a paper on bentonite falls in the Wenlock rocks of Wenlock Edge and Eastnor, Herefordshire (D.C. Ray 2007) which makes interesting reading and confirms that volcanic activity was occurring within 50 miles or so of the area.

References:

Ray, D.C. 2007 *The correlation of Lower Wenlock Series (Silurian) bentonites from the Lower Hill Farm and Eastnor Park boreholes, Midland Platform, England*. Proceedings of the Geologists' Association Vol.118 Part 2 pp. 175-186 2007.

Shropshire Geological Society 2007 -
Wenlock Edge; From tropical seas to wooded escarpment.
A Geotrails leaflet

Siveter D.J., Owens R.M., & Thomas A.T. 1989 - *Silurian Field Excursions: A geotraverse across Wales and the Welsh Borderland.* 133pp. National Museum of Wales, Geological Series No 10, Cardiff.