

Malvern Quarries

19 September 2026

Under the expert guidance of Andy and Simms of the Hereford & Worcestershire Earth Heritage Trust, ably assisted by his wife Mandy, eleven NGS members visited two quarries in the Silurian rocks to the west of the Worcester Graben Boundary Fault. Here, the Silurian sediments have been tilted in the Variscan orogeny.

The first site was Whitman's Hill Quarry, two miles northwest west of Malvern and a short walk from the village of Storridge. The quarry was active until the 1990s, and its entrance at the northwest corner affords a great view of the Silurian layers, dipping westwards, in the southern wall of the pit.



Fig. 1: the southern face of Whitman's Hill Quarry, with the Silurian formations dipping to the west and labelled.



Fig. 2: the Much Wenlock limestone in the northern face; note the large block with massive structure in front of our leader (and scale!), Andy. The large lumps in the face are stromatoporites. At the easternmost (right) end of the exposure a small outcrop of the nodular limestone (layer 3) is exposed too, and it grades upwards through the tabular beds just left of Andy's head into the massive reef structure (see fig. 3 overleaf).



Fig. 3: nodular base (layer 3) with plenty of mudstone, transitioning up into tabular limestones with less mud and finally into the massive Much Wenlock formation.



Fig. 4: Rugose (horned) coral in the reef.



Fig. 5: Crinoid stems, bivalve shells in the reef.

We moved down to the bottom of the pit, where the Coalbrookdale formation is exposed and, as overburden, piled up into the bunds visible in figure 1. These friable mudstones are very fossiliferous and their rapid, continuous deposition results in little internal structure. Spherical weathering, typical of mudstones, is clearly visible.

Below: clockwise from top left, Figures 6-9, all from the Coalbrookdale formation at the base of the quarry.



Fig. 6: gastropods



Fig 7: shell of a spiriferid brachiopod (butterfly shell).



Fig. 8: a fine example of a rugose coral.



Fig. 9: an nautiloid shell with corresponding trace.

We then moved south some four miles to the much smaller Brockhill Quarry near Colwall. The rocks here are still Silurian, but higher up in the sequence than Whitman's Hill. Progressing from Upper Ludlow Shales through to the Downton Castle Sandstone, this small quarry provides an outstanding example of a marine regression, from fully to

marginal marine sediments; this site marks an ancient coastline. It is of much of interest sparks a lot of debate in geology.



Fig. 10: the Brockhill Quarry face, with the marine Upper Ludlow Shales to the left (man in hi-vis vest) and moving up sequence to the right into the estuarine Downton Castle sandstone on the extreme right. The transition from marine to estuarine takes place roughly where the sawn-off tree stump is.



Fig. 11: at the base of this sequence, the Upper Ludlow Shale (actually a siltstone, rather than the implied mudstone). Nodular in texture, this deposit shows a low-energy environment and was laid down below wave base.



Fig. 12. Moving up sequence (to the right in fig. 10), we move into a calcareous siltstone with increasing grain size and evidence of wave action in the ripple drift visible where the tops of bed layers are visible (photo). This shows a shallowing sea, with a higher-energy environment with grain size increasing and the seabed now above wave base.



Fig. 13. Higher up, in the increasingly shallow sea, there is clear bedding with hummocky cross-bedding, a lens typical of this type of bedding indicated.

In fig.10, this is now towards the right end of the smooth quarry face adjacent to the person closest to the camera.



Fig. 14. We next come to, by the sawn-off stump, we an exposed **hardground** (1); this is a drying surface, which remained dry long enough for diagenic precipitation of calcite and other minerals and thus lithification into a hard surface. Hardgrounds are important markers in sea level change and thus in sequence stratigraphy. Subsequent flooding of the surface halted precipitation and deposited a thin, soft layer of micaceous, laminated units analogous to the Ludlow Fish Beds (2), in which calcite precipitation ceased, and then up into the estuarine siltstones (3), increasing in grain size off to the right into the Downton Castle Sandstone. Andy Simms for scale!



Fig 15: detail of the transition from hardground (left), through soft, laminated layer (trowel) into siltstones (trowel handle).