

Exploring the Palaeozoic of the West Midlands, UK



Six months of research and planning culminated in our 1 day field excursion around important Palaeozoic outcrops of The West Midlands. A diversity of keen geologists with associations to The Geological Society - West Midlands Regional Group (WMRG), The Black Country Geological Society (BCGS) and Birmingham University, came together to enjoy a full day in the field. The trip was put together and documented by Ray Pratt of the WMRG and was led by Julie Schroder of the BCGS (BCGS) and Andrew Harrison of both the WMRG and BCGS.

The trip started at the Lickey Hills Country Park where the group visited 2 old quarries with exposures of the early Ordovician Lickey Quartzites laid down as shelf sandstones and later metamorphosed to quartzite. At the time of deposition the locality would have lain about 60 degrees south of the equator. There are a number of claystone beds interlaminated with the quartzites, many of which contain volcanic ash. The Lickey ridge is an inlier with a mapped general anticline structure with a strike NNW-SSE. However the beds in the upper quarry dip SSW therefore the strike is WNW - ESE (similar to the mapped trend). In the lower of the two quarries chevron folding is seen in the more reddish coloured (and probably older) quartzites, in an overfold to the south with a strike in a circa EW direction.



Lickey Quartzite Chevron over-folding - Barnt Green Road Quarry - *(Photo courtesy of John Schroder)*.

The second outcrop was at the Rubery road cutting where the eroded surface of the Lickey Quartzite is unconformably overlain by the early Silurian transgressive deposited Rubery sandstone. (Borehole data shows that silts and muds overlie the Rubery sandstone indicating a deepening environment of deposition). At the time of deposition the locality would have been approaching 30 degrees south of the equator as part of the Avalonia plate that was moving northwards narrowing the Iapetus Ocean.

A neptunian dyke is also present at this locality. Both formations are seen to be dipping in the same direction at the same angle indicating folding of these beds was later than early Silurian.



The hammer marks the UC and the neptunian dyke is seen to the left side of the picture.

Our third stop was to examine 2 outcrops of Silurian Limestone at the world famous site of the Wrens Nest. This location is another anticline inlier, this time exposing the Wenlock Limestone, where we looked at both the Upper and Lower Quarried Limestones and the Nodular Beds which lie in between. These limestone's are packed with fossils, some of which led to the international reputation of this SSSI location.



Examining a reefal assemblage within the nodular limestone beds.

We continued with our upward traverse of the stratigraphic column of the region at our next location, Saltwells Nature Reserve, where we took a look at the late Silurian, Pridoli, calcareous sandstones indicating a closer to shore environment. Fossils here were dwarfed indicating a less than ideal environment for life.

During the Devonian the Iapetus ocean closed and the region became landlocked. There are no Devonian outcrops in the region so unconformably overlying the Silurian are basal conglomerates of Carboniferous or Westphalian age. These are fluvial deposits. The striking thing to note is that both the late Silurian and mid Carboniferous deposits dip in the same direction at the same angle indicating a tectonic event later than Westphalian.



In the picture the shadow follows the line of the basal conglomerate.

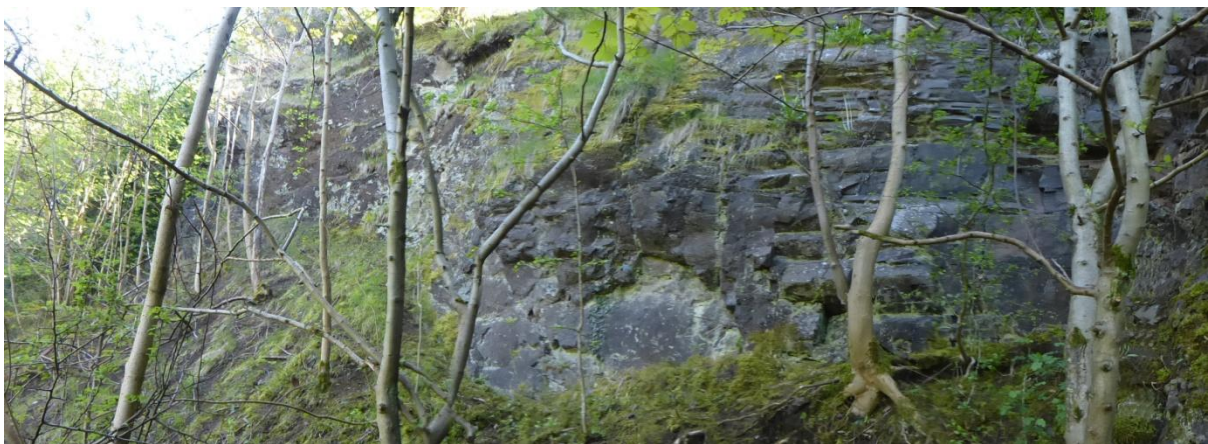
Close to this location on our way to Doulton's clay pit we pass a late Carboniferous dolerite plug intruding into the late Silurian calcareous sandstones.

At Doulton's clay pit we got to examine fluvial cross-bedded sands, agglomerated channel sands, remnant kaolin rich seat earth and occasional thin organic-rich coaly layers. (Most of the fire clay (seat earth) and coal was extracted many years ago). The region was a low-lying deltaic swamp close to the equator with large river systems depositing thick channel sands. Deposition was thought to be cyclic although there is currently no evidence for this at this location.



Channel sands with kaolinite rich clays

The final outcrops visited were at Barrow hill where late Carboniferous basalt plugs, (remnants of volcanoes), represent the youngest of the Palaeozoic outcrops to be visited on this trip. Igneous intrusions and extrusions were common in many parts of the UK during the late Carboniferous as the Variscan Orogeny climaxed.



The Permian deposits of the region are represented by Clent Breccias, but we did not get to see these on this occasion.