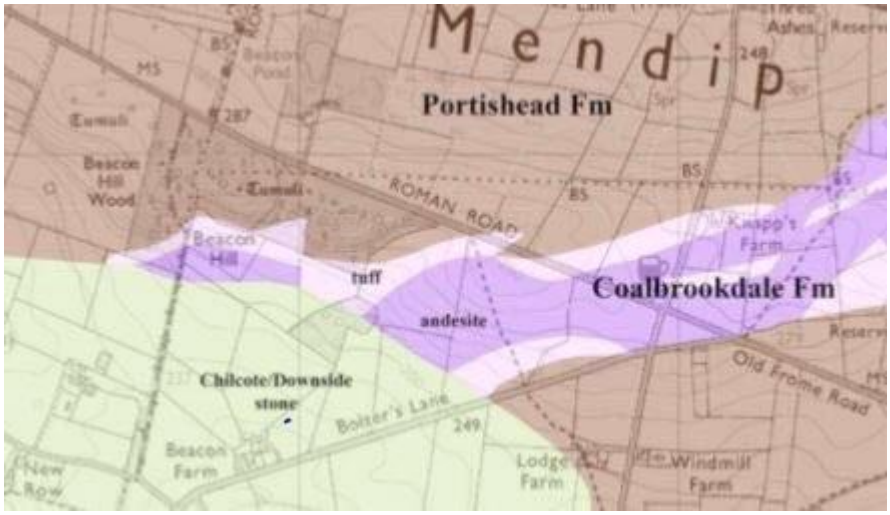
BEACON HILL FIELD TRIP. May 14th 2018.

Led by Doug with support from Chris.

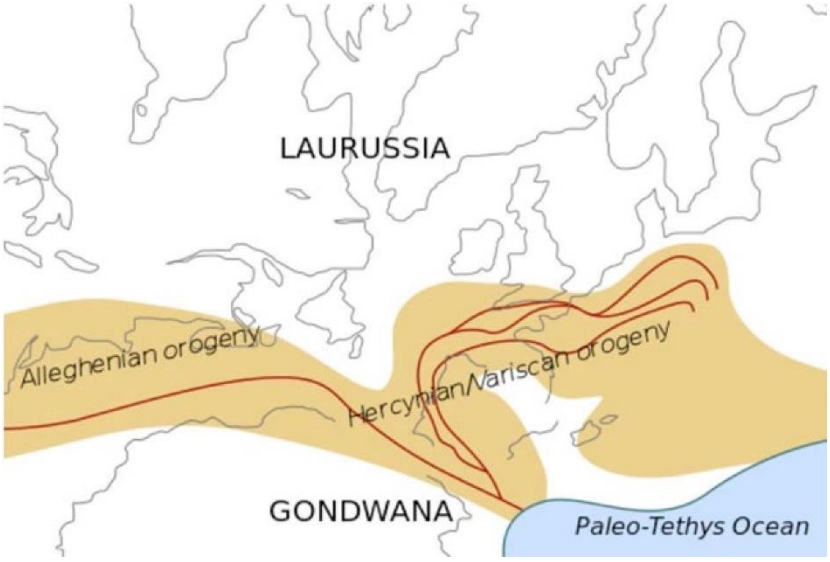
The weather was glorious and about a dozen of us met at the car park at 10.00 am and proceeded to the View Point which was stunning with a view over to Glastonbury Tor and far beyond. There we had a discussion on the up-folding of the Mendip rock beds and subsequent erosion exposing the Silurian strip flanked by Devonian on the northerly side and the Blue Lias limestone from the south.



Immediate sketch of the Silurian strip.

On looking at the detailed geological extract we saw the Devonian (shown in brown) and the volcanic Silurian (shown in purple) we did not see Carboniferous limestone or the Triassic dolomitic conglomerate in the tight area below.

At this early stage there was a discussion about where the future chunk of land mass called Britain" actually originated. Deposition of Silurian/Devonian rocks was when the area lay about 30° S of equator, followed by deposition of Carboniferous Limestone as the "chunk" or area drifted northwards towards 15-20°S of equator. As the area crossed the equator it was the time of the collision between Gondwana (basically Africa) and Larussia (basically North America) to form the Variscan Mountains, of which the Mendips are part.



Following the collision the area drifted into northern tropical region, which is when the arid Triassic rocks (which we didn't see at Beacon Wood) were deposited. Then the region continued its northward drift into sub-tropical setting which is when the early Jurassic seas advanced over the former desert to give the Chilcote Stone (a carbonate beach) deposit, which was represented by the flat farmed land immediately south of the wood.

Doug then explained we can deduce the Latitude where rock was formed but not the Longitude, hence we can say equal to today's Chile or today's Caribbean, since we see these processes happening in these areas today.

Stop # 1.

Doug showed us a small quarry working which showed the typical soft redhued Devonian rock formation. The surface showed splitting suggesting the rock had been stretched in the up-folding process. According to the slope of the splitting it proved the Devonian rock here was just on the northerly side of the up-folding which had probably taken place about 416 to 359 million years ago. Thus, Doug explained, we can deduce the latitude where a rock was formed but not the longitude.

Left Devonian rock showing the cracking produced by up-folding.

Right Graphic demonstration of the crunching of the continents by Chris .

Stop # 2.

A few metres away in the beautiful woods we stopped at a very small quarry showing more Devonian Sandstone containing pebbles of varying sizes which were quite rounded implying some had reached quite a high velocity as the rocks were being washed down river beds possibly originating from as far north as Caledonia.

Deposition of stones of varying size as described above.

At this stage Doug explained the term "Fining up". "Fining up" apparently follows a huge storm; large amounts of debris are washed down a river bed. When the flow is at high velocity it can move large rocks and pebbles. As the velocity decreases so the heavier material drops out and settles on the river bed. When the velocity continues to slow down the medium sized material deposits itself down and collects on the surface. Because of disrupted flow some fine material gets trapped between the larger materials but more of the fine stuff gets washed in later.

Eventually the water flow slows to normal speed and the finer sediments can drop out of suspension, because of the gradual slowing of water the deposits show a grading of material from large to small.

In the photograph this is seen with larger pebbles at the base of the section, followed by smaller and smaller pieces until the grain size is little more than sandy mud. The section from the middle of photo to top RH corner is just one event and could have been deposited over days/weeks. The lower part of the section, middle of photo downwards is just fine material and deposition rates here could be measured in 100's of years.

Stop # 3.

The importance of looking at the flora and vegetation on the ground showed there was a sharp difference shown by the presence of a strip of Bluebells corresponding to where the Silurian strata were to be found.

Note the bluebells in the shade.

Through this wide stretch of bluebells we found ourselves walking along an old Roman road which was part of the road from Exeter to Leicester. Here the fractured rock was much darker than the earlier sandstones. Under a hand lens it showed small white crystals of Feldspar in Andesic lava. It was postulated that some of the lava being so fine it might well have been recycled to form tuffs from the underlying volcano because this was volcanic rock. (This was noted to be quite hard rock and probably some of it used to form the surface of the Roman Road).

Harder darker surface of Silurian rock.

The volcano erupted lavas, of which some remains are solidified lava flows; some rained down as ash and were slowly cemented together. Some ash fell into the sea and was washed up to form other beds of ash so we have the same base material presented in different forms. But the rock types are both called Tuffs. The small crystals show that the lava cooled very quickly.

Stop # 4.

Here we walked a short distance down the Roman path to its junction to completely flat ground and found almost to the inch the junction of Devonian on one side and Downside (Chilcote) stone on the other. Around about 250 million years separate these two rock types which formed the two boundaries which had previously been 30^0 North of the old equator and about 30^0 South of the equator all those millions of years ago.

Stop # 5.

We next saw an old (historical and not Geological terms!) boundary stone which was used to demarcate land boundaries. It consisted of Doulting stone and was not originating from this area. The main land holder was a William Mellor and we found his name inscribed in 1838.

Stop # 6.

We walked around the border of the wood until we were shown a sudden fault in the ridge.

Stop # 7.

We passed one of several burrows and recent quarries and finally found a notable Standing Stone (see below) before we departed our several ways.

POST SCRIPT;

At the end of the walk Prof Chris asked us to imagine the sequence of events which might have taken place over several millions of years.

1. The story took place as the plate moved gradually northwards
2. First was the volcanic eruption somewhere around Chile spreading massive quantities of volcanic ash.
3. Next the whole area was quiet and lay like a massive desert with heat all around.
4. From time to time water deluged the area in the form of a flood, washing down and depositing pebbles and thick sequences of sand.
5. The sand coalesced into rock, namely sandstone. The sand grains were glued into sandstone by quartz crystals and also infiltrated with iron.
6. Advancing continents heaved together namely the Europe-Asia land masses crunching against the African land mass, and folded the rocks into mountains, perhaps 1500 metres above the current level. Amongst these were the Mendip Mountains.
7. Next much weathering and erosion in the new desert conditions north of the Equator took place which lowered of the level of land.
8. Then the sea invaded this land, and sediments made of fossil remains were laid down as layers of Lias.
9. Finally, the land was eroded to the shapes that it has today.

This summary would not have been possible without the help of friends much wiser than me. I am grateful to Steve for some guidance at the beginning of putting pen to paper. I thank Doug not only for making the time to meet and show us around such a beautiful part of England, but also for looking and correcting the near final stage of this draft. My thanks to Chris for making us look back on the sequence of events recorded in the postscript. Last but not least thanks too to Sue and Gaye for the photos.

Walford