NE.G.S. Field Trip, July 7th 2012: The Sedgwick Geological Trail

Considering the atrocious weather of the last few weeks, 6 enthusiasts, including our leader Dr. John Knight, assembled on a bright warm sunny morning at the starting point (SD694912) for the Sedgwick Geological Trail about 2 miles east of Sedbergh on the Hawes road. The weather, unbelievably, stayed that way all day.

An explanatory leaflet, obtainable from the Yorkshire Dales National Park Committee, explains the fascinating geology surrounding the Dent Fault in Garsdale formed some 290Ma. in late Carboniferous times during the Hercynian Orogeny. At this locality the rocks of the Lake District were uplifted possibly by as much as 2.5km above those of the Pennines. Adam Sedgwick (1785-1873) was the first to discover this important fault and interpret the awesome events which led to its formation.

After admiring the contrast in views of the Silurian Howgill Fells to the west and the relatively horizontal Carboniferous rocks to the east our leader explained how the rocks to be examined ranged in upward sequence from **Silurian** Brathay Flags, a **Devonian**? **or Basal Carboniferous?** Conglomerate, and **Lower Carboniferous** rocks of the Orton and Great Scar Limestone Groups. The latter in this locality are subdivided in ascending sequence as follows: **Orton Group:** Tom Croft Limestone, Ashfell Sandstone; **Great Scar Limestone Group;** Fawes Wood, Garsdale and Danny Bridge Limestones.

The first locality to be visited was Danny Bridge (SD698913). Our leader pointed out how most of the limestone beds along the section to be examined dipped steeply, about 60 deg., in an easterly direction. At one point, however, a distinct anticline was observed. Bedding planes were clearly visible as well as joints at right angles to them, probably the result of folding and shrinkage. Beds in the Great Scar Limestone are generally almost horizontal, but here they have been uplifted and folded due to faulting (downthrow to the east) and compression.

Fossils in the limestones, especially where they were water-washed, were examined. These consisted of colonial corals, mainly Siphonodendron (formerly known as Lithostrotion) and large brachiopods, mainly Gigantoproductus.

At some localities, especially within the Ashfell Sandstone, beds of siltstone and sandy limestone were examined, indicating some cyclicity in the rock succession, but certainly not as obvious as in Yoredale type sequences as seen in e.g. in Wensleydale. Furthermore, on some limestone surfaces, thin lenses and nodules of black chert, a type of cryptocrystalline quartz, were seen, possibly indicating a break in sedimentation. The silica probably originated from solution of siliceous skeletons of marine creatures such as sponges.

As the Dent Fault, or one of its subsidiaries, was approached, mineral veins within the limestone were observed. These were interpreted as infilled tension gashes, the result of fault movement. The fault itself was observed, with steeply dipping limestone beds and an exposure of Silurian Brathay Flags, consisting of hardened mudrock steeply dipping to the west. Examination of these rocks yielded several well preserved graptolites, interpreted as *Monograptus* sp.

A little further to the west, the steeply dipping Brathay Flags were seen to be overlain unconformably by a subhorizontal conglomerate. The gap in time between erosion of the Brathay Flags and deposition of the conglomerate could be as much as 50Ma. Most of the pebbles in the conglomerate were seen to have a reddish colour, indicating subaerial deposition in arid desert-like conditions.

At around 4.30pm the party, still enjoying a warm sunny environment, made its way back to the car park where our leader, Dr. John Knight, was given a heartfelt thanks for such an interesting and informative day.