

FGS field trip to Devon - October 2010

Saturday - led by Richard Bull – the FGS members visited Chippel Bay, where a full succession of the Lower Jurassic Blue Lias occurs. The classic Shales with Beef (fibrous calcite) and the Black Ven Marls could be seen above the Blue Lias. The Lower Jurassic beds in this area are fossiliferous with ammonites, belemnites and, occasionally, ichthyosaurs and plesiosaurs. Blocks of Cretaceous Upper Greensand were seen with trace fossils, including worm tubes; these blocks have come from a massive landslip inland. The Cretaceous was also seen at Pinhay Bay where Chalk and Upper Greensand lies above the Blue Lias, which in turn overlay the White Lias of latest Triassic age, Rhaetian. A range of bivalves including *Rhaotavicula contorta*, *Chlamys valonensis* and *Protocardia rhaetica* occur. The White Lias comprises pale grey limestones. One of these beds is highly 'jumbled' and appears to have been the result of a severe storm. The lowest beds (part of the Penarth Group) form a condensed sequence, just 30 cm thick.

The group went on to the Cobb to view Lyme Regis where the coastline is extremely unstable. The whole area is formed of Upper Greensand (weathered brownish green) and Chalk on the hilltops; these strata were deposited unconformably onto the grey Liassic marine clays. The underlying clays give rise to frequent landslides in the area and allow rapid sea erosion which exposing the many fossils, evident in the Lyme Regis Museum which was visited at the end of the day.

Sunday - led by Malcolm Hart and Graham Williams – the group went to Seaton Hole and to Beer, where the Upper Greensand and Chalk overlie the red Triassic Mercia Mudstone. The vertical white cliffs of Chalk are the westernmost Chalk cliffs along the English Channel and the strata are different to those further east. Flint, often black and tabular, is common not only in the Upper Chalk but also in the top half of the Middle Chalk. The Middle Chalk shows numerous pale brown phosphate bands. The lower Chalk is of shallower water origin with hard-grounds and seriously condensed sequences with numerous chalk intraclasts. After viewing the gigantic landslip at Hooken Cliff, the group continued to Branscombe where the red Triassic mudstones crop out beneath the Cretaceous Chalk. Extensive gypsum 'beds' and fracture fills are a feature. Further west, towards Sidmouth, Triassic red-beds occupy most of the cliff.

Monday - led by Graham Williams – the party continued to Budleigh Salterton to view the Triassic Budleigh Salterton Pebble Beds and Otter Sandstone and on to Ladram Bay.



Fig. 1: View (~5mx5m) of cliff at Budleigh Salterton – note the steep (30°) dipping poorly sorted boulders at base of the cliff, then an erosion surface (1/3rd way up) dipping from R to L in the picture, above which there is a sequence of coarser boulder beds which are also poorly sorted but gradually fine upward, culminating in a thin sandstone (not visible in this photo). This upper boulder bed sequence probably represents one flash flood deposit. The steepness of dip of the beds and the size of the boulders in both sequences would suggest that they were deposited in a proximal wadi environment



Fig. 2 An excellent example of rhizoconcretions – these are root traces - over time the roots gain a coating of cement which is called a rhizoconcretion

The first stop was **Budleigh Salterton** (Judith Wilson) where the question “are these rocks fluvial or aeolian?” was posed. The rocks were red coloured, the lower layer consisting of some very large pebbles which quickly answered the question, as these could not have been deposited by wind (Fig. 1). Orientation of some pebbles and bedding structures indicated the direction of flow. Further along the beach, rhizoconcretions structures were seen, (structures which form around roots) and together with the presence of ferrous oxide converted from

ferric oxide again indicate the presence of water.

Ladram Bay: There was an amazing outcrop here showing many sedimentary features. The lower bed was a jumbled up muddle, described as a sheet flood deposit above which was an erosion surface. Above this was a fine bedded sand, which had been laid down in a high energy environment, then a further erosion surface. Similar beds continued, each indicating water and high energy. The depositional environment was thus a desert sandstone over which vast intermittent flood materials were deposited.

The remaining question is “Which members of FGS took advantage of the sign welcoming nudists on the beach at Budleigh Salterton?”

Liz Aston and Judith Wilson