

Hele Beach, Ilfracombe.

NGR. - SS 536478, Landranger Sheet 180 (1:50000) Explorer Sheet 139 (1:25000)

Time on your hands in Ilfracombe? I found this little gem whilst scanning back copies of Cornubia. It was scanned and converted to text using OCR, I have read and corrected it but please let me know if there are any errors. Many thanks go to David Cox.

Hele Bay, a smallish cove at the east end of Ilfracombe. If you find yourself in the area with an hour or so to spare a visit is well worth the effort, however on its own it does not justify a special journey. Perhaps a way to fill in time while the family does other things.

A suggested itinerary is attached which raises some questions to ponder over as you progress.

Mostly the access is on a sandy foreshore, there are some rocky ridges to negotiate but most of the exposures are easy to get at and you do not have to walk more than 400 metres to see all of them. There is a public car park close by and at the time of writing (Jan 2004) it is free. The only proviso is that you must time your visit to fit in with the tides, there isn't very much beach visible at high tide!

The rocks exposed here are the Combe Martin Slates, which are part of the Ilfracombe Slates Group. These have been folded and metamorphosed to give the slaty cleavage that has led to their name.

They are of Frasnian (Devonian) age, comprising shales, siltstones and thin sandstones with occasional limestone bands & lenses; generally fissile, splitting into thin flakes along the cleavage. Usually pretty featureless, 'only the presence of the distorted bands of limestone reveals the original bedding and shows the cleavage for what it is.

These limestone bands, being more competent, do not exhibit slaty cleavage but are considerably deformed into sinuous or "wiggly" bands across the dominant cleavage. It should be possible to arrive at a figure for the amount of shortening due to compression by "straightening out" these wiggles.

Some exposures show folded bedding with the cleavage perpendicular to the axis of the fold, 'axial plane cleavage'.

There are also exposures that show quartz filled tension gashes and others that show what appear to be 'boudins' in the limestone beds, implying extension rather than compression.

NB. The limestone strata throughout this area is dark grey, often weathering to 'rusty' brown, no doubt there is some iron present in the carbonates. This can be confusing as it can sometimes look like sandstone unless showing a freshly broken face.

References:

Durrance E.M. & Laming D.J.C. Eds. The Geology of Devon; Univ. Exeter 1982; pp 33 & 34.

Edmonds E.A., McKeown M.C. & Williams M.; Brit. Reg. Geol. S.W. England. HMSO 1969; pp 30 - 33.

Edmonds E.A., Whittaker A. & Williams R.J.; Geology of Country around Ilfracombe & Barnstaple, HMSO 1985; pp 11 - 18. 1

Itinerary.

- 1 Turn right on leaving the car park and walk down onto the foreshore. Go to the right and in about 70 metres there is a small spur of rock jutting out, at beach level on the surface facing you as you approach there is an overturned small tight fold which shows axial plane cleavage. Depending upon the level of the sand this may be hard to spot, 2 prominent quartz bands serve as a guide.
- 2 Continue for about 25m to another small promontory of the cliffs where there are some quartz filled cracks on the west face, (the one facing you as you approach). Are they tension gashes or is there an alternative cause?
- 3 A further 75m brings you to evidence of intense folding as shown by a very wiggly limestone band. How much shortening has occurred?

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- 4 Go around the next corner of rock, (about 5m) and find an example of the bedding 1 cleavage orientation. This is part of the same limestone band but viewed from the side. The angle between the 2 orientations is about 45°.
- 5 Just to the east of this (about 5m) note a folded limestone band high up on the cliff, under the overhang.
- 6 In another 15m is another example of the cleavage/bedding relationship.
7. Continue to the eastern end of the beach near the masonry wall, about 15m (some rocky ridges to traverse). Here the limestone bands appear to demonstrate 'boudinage'. This suggests extension has taken place. How does this fit in with the folding, therefore compression, seen earlier?
- 8 Near here, on top of the wave wall, (for those who don't mind climbing up) there is seepage of calcareous water, which leaves tufa deposits formed by the calcium carbonate precipitating out on meeting the atmosphere.

Return to the point where you first joined the beach.

The exposures on the western side of the bay, across the stream, show more of the same and, if the stream is running high, do not justify getting wet feet!

D.J.Cox. January 2004

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