



CORNWALL RIGS

"Conserving Cornwall's Geological Heritage"

A GEOLOGICAL TRAIL AT TREBARWITH STRAND NEAR TINTAGEL

Ordnance Survey (OS) EXPLORER 111 map – Bude, Boscastle and Tintagel

To do the whole walk you will need a low spring tide. DO NOT enter Hole Beach as the "walk window" is only a few minutes at low tide and YOU WILL BE CUT OFF BY RISING WATER. Park at the NCDC car park which is on the right hand side before you enter the village. Please check the tide before you set off and wear sensible footwear. You should see all the walk by keeping on the sand.

Whilst in the car park cast your eyes across the little stream to the cliff beyond and you will see an underhang at the base of the cliff.(shown to the right) Note a rock which is pale and fine grained. You are looking at the banded slates with limestones of the Barras Nose Formation which is Lower Carboniferous in age.



These rocks were laid down in relatively quiet waters where creatures were able to live. Raise your eyes to the darker rough-looking rubbly rock above which seems to be a mixture of something very coarse mixed in with a rock which looks very soft and heavily eroded. You are looking at the Tintagel Volcanic Formation which is a mixture of fine ash and lava bits combined with much coarser blobs. These are large bits of lava in the form of volcanic bombs which were erupted sporadically in short lived but explosive marine volcanicity.



Now walk down towards the beach and follow the cliff alongside. Note that it is dipping downhill with you but not enough for you to see the Barras Nose Formation again. As you walk down from the road onto the Sanding Way to the beach you can see squashed lava bombs in the smooth rocks at your feet. The pink 'rock' in between is a soft mineral called calcite which is seen throughout this formation.. The volcanic rocks are seen in the cliff and foreshore on the beach, but again the base of the formation is not visible. The Sanding Road has been cut through this volcanic 'agglomerate'



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showing fine examples of these dark grey lava bombs which often stand proud of the surrounding ash or tuff in which they lie. The bombs are aligned in one direction (to the northwest) because the rocks have since been highly stressed during subsequent folding and deformation.

Before going on to the beach walk to the left and look at the stream tumbling across the volcanics. Look at the way the stream has abraded and eroded the soft rocks to smooth potholes. You will see the river's abrading tools in the little circular pools – they are a constant supply of pebbles which are swirled round in the eddies and act like coarse sandpaper. This stream from where it emerges from the roadway to the sand on the beach is a RIGS site. Sometimes if the sand level is low enough you can see a natural arch over the stream at its lower end near the beach.



If you now go onto the beach and look left to the high cliff face at the far end you will see several fault lines running steeply down the cliff and ending at sea level as a cave. The sea has eroded into the fault lines where the rocks are at their weakest and has gradually enlarged the holes to caves.(shown to

the left) In some areas as at Tintagel the sea has eaten its way right through a headland to produce a through cave, e.g. Merlin's Cave. The rocks you are looking at here are older than the Volcanics and are actually Devonian in age. They are Upper Delabole slate. Turn right and if it is low tide you will be able to walk round the rocky outcrop and out on to the beach at Lill Cove. If you turn your eyes to the very top of the cliff you are looking at Upper Delabole slate again, below it (though may not be able to distinguish it from the slate above) is the Trambley Cove Formation, and then below that a change in rock type to the rubbly blocky look of the Tintagel Volcanic Formation. You may be wondering why Upper Delabole slate is sitting on top of much younger Lower Carboniferous rocks and the answer is that they are separated by a large low angle fault which runs down the cliff towards the beach and extends the whole length of the beach. The Upper Delabole slate is in what is termed a fault slice or nappe which has been introduced and driven in on top of the Carboniferous rocks from somewhere far to the south.

Continue along the beach into Veian Hole. The fine grained tuffs of the volcanics contain big crystals of gold pyrite – some up to 5mm long. You can



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see them in the loose rocks at the edge of the sand. Higher in the cliffs the junction of volcanics with the Trambley Cove Formation is gradational with slates containing many lenses of tuff and bombs indicating that volcanic activity continued through Barras Nose and into Trambley Cove times. Sandstones forming large boudins (or sausages) are present in the cliff face. Higher still, above the Trambley Cove Formation, the major low angled fault we talked about at Lill Cove is seen again, inclined to the west and separating this formation from thin sheets of altered soft talcose weathered dolerite (an igneous rock) intruding the Delabole Slate.



Just north of Vean Hole is a 7m lens of lava between banded volcanics and slates of the Trambley Cove Formation. Large scale boudins in the Trambley Cove Formation (at the junction of the volcanics) 5m wide and 1.5m thick with quartz veining and minor faulting in their nodes are present in the cliffs. They are some of the best you will see in

this area. Their sausage lengths trend perpendicular to the cliff face and are a product of tension and stress during folding and thrusting. (See above)

Heading north between Vean Hole and Hole Beach, right at the northern end of Trebarwith Strand look up to your right into Lanterdan Slate Quarry. It was once one of the biggest in North Cornwall and its products were exported from a wharf (now long-since taken by the sea) at Lower Penhallic Point. The quarry worked Upper Delabole Slate and the workings never reached the shore as the fault we have talked about previously runs along the base of the quarry where you cut down through the fault line into the Trambley Cove Formation which was no good to the quarrymen!.



Lanterdan Quarry is now National Trust property and is a RIGS site for its brachiopod (spiriferid) fossils (See above) and also a rare mineral called monazite. You must obtain permission from the National Trust to enter this quarry which can be viewed very well from the coastal path above.

Return to the far end of the beach for an ice cream, and admire the views!



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Area map – Not to scale

