DORSET LOCAL GEOLOGICAL SITES SURVEY

Site number G SY98/16

Site name Corfe Castle Twin Water Gaps

Geomorphological site.
A double water gap in the Chalk ridge of the Purbeck hills. Two streams, the Corfe River and the Byle Brook, both of which rise in the vale cut along the outcrop of the Wealden Beds to the south of Corfe Castle, have eroded deep parallel gaps to isolate the hill on which the Castle is built. The two streams unite immediately to the north of the castle. The site is remarkable because these small streams cut directly across the structural grain of the Purbeck hills, after flowing for most of their courses parallel to the strike of the Wealden Beds, where they may be regarded as subsequent streams. These twin gaps may be compared with similar twin valleys (now dry) in other places along the Chalk ridge that were probably initiated during the Pliocene. In each case the twin valleys correspond with two separate phases of fault movements, so that the streams would have taken advantage of areas of weakened Chalk. Movement on the fault can be seen in the Chalk exposed above the western stream.

Site description

Geomorphological site.
Corfe Castle is the site of a double water gap in the Chalk ridge of the Purbeck Hills. Two streams, the Corfe River and the Byle Brook, both of which rise in the vale cut along the outcrop of the Wealden Beds to the south of Corfe Castle, have eroded deep parallel gaps to isolate the hill on which the castle is built. The two streams unite immediately to the north of the castle.

The site is remarkable because these small streams cut directly across the structural grain of the Purbeck Hills, after flowing for most of their courses parallel to the strike of the Wealden Beds, where they may be regarded as subsequent streams. It is likely that they have been superimposed from the emerged Pliocene sea floor, which would have cut across the various beds now exposed in an east-west direction in the Isle of Purbeck. The Corfe streams would have been members of a series of streams initiated on the uplifted Pliocene sea floor, including those whose past courses are marked by the wind gaps at Cocknowle, Lutton and Tyneham to the west, and the gap at Ulwell to the east, although the latter does appear to have had a more complicated recent history.

The twin gaps at Corfe may be compared with similar twin valleys (now dry) in these other places along the Chalk ridge that were probably initiated during the Pliocene. In each case the twin valleys correspond with two separate phases of fault movements, so that the streams would have taken advantage of areas of weakened Chalk. Movement on the fault can be seen as slickensides in the Chalk exposed above the western stream at SY9569.8225, in the Campanian Zone of the Chalk.

It is not easy to explain why the other members of this superimposed series of streams abandoned their courses across the Purbeck ridge at such a relatively early stage. Perhaps their upper courses to the south were disrupted by subsequent development in the Wealden Clay vale. Similar development to the south of Corfe Castle may have increased the erosive power of the Corfe streams and enabled them to continue to incise their courses across the Chalk ridge at Corfe. The western of the two streams has cut a fine incised meander through the ridge, leaving a well-developed meander scar on the eastern slopes of West Hill mapped as in the Spetisbury Chalk Member, and the eastern stream has cut an equally impressive gorge between the Castle hill and East Hill.

Twin water gaps in the Chalk ridges in southern England are relatively uncommon. Two twin gaps do exist in the Isle of Wight, at Carisbrooke and at Brading, but in both cases one of the gaps has now become dry. The gaps at Corfe Castle, each still occupied by a stream that has deeply incised its course across the Chalk ridge, constitute a site of much geomorphological interest and worthy of recognition as a R.I.G.S.

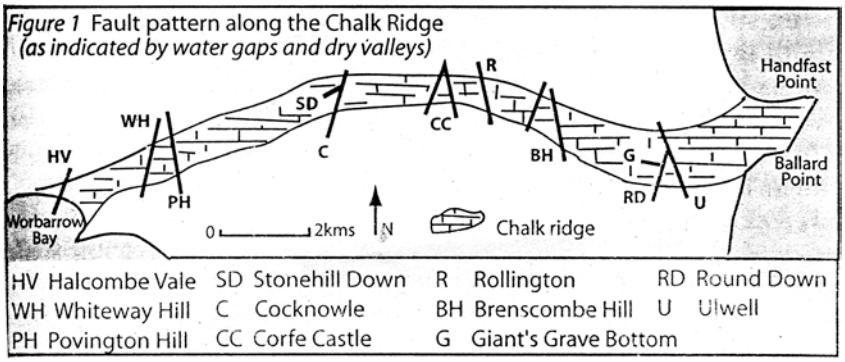

Diagram of faults by Dr. Mike Cosgrove