



Under the Undercliff

The 'Undercliff' is the name given to a 12km long narrow tract of coastal land between Blackgang to the west and Bonchurch to the east, on the southern coast of the Isle of Wight.

The underlying geology here is unstable, and it is an ancient landslide complex. Indeed, it is the largest landslide complex in north-western Europe. It is a dramatic and beautiful landscape to explore.



Blackgang: The Disappearing Village

The picture shows the very western end of the Undercliff at Blackgang Chine; you can see the roller coaster which is part of *Blackgang Chine Amusement Park*, in the foreground. The instability of the coastal

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tract here is clearly evident. Blackgang Chine is a spectacular 1/2 mile down to the shore at Chale Bay. Continual landslides here led to the total collapse of the chine, so Blackgang Chine no longer actually has the Chine of its namesake!

The owners of the park, reputed to be the oldest 'theme park' in the UK (opened in 1883), have repeatedly had to move facilities inland to take account of the continuous landslides here.

The most recent and destructive landslides occurred in 1928, 1961 and 1994. The community at Blackgang is diminishing with extensive loss of property, infrastructure and land since the area was first developed by the Victorians as a tourist attraction in the 1840s.

Rickety rocks...

So, why so unstable? Geology, the underlying rocks, is the answer!

The Undercliff lies below the chalk escarpment which runs the 'spine' of the island, from the Needles stacks in the west, to Culver Down in the east.

It is a 0.25-0.5 mile-wide tract of 'slipped land' which formed thousands of years ago when climatic conditions were very different to what they are today.

Studies have shown that two main phases of landsliding occurred; one following the last Ice Age, between 8,000 and 4,500 years BP (Before Present), and another between 2,500 and 1,800 years BP.

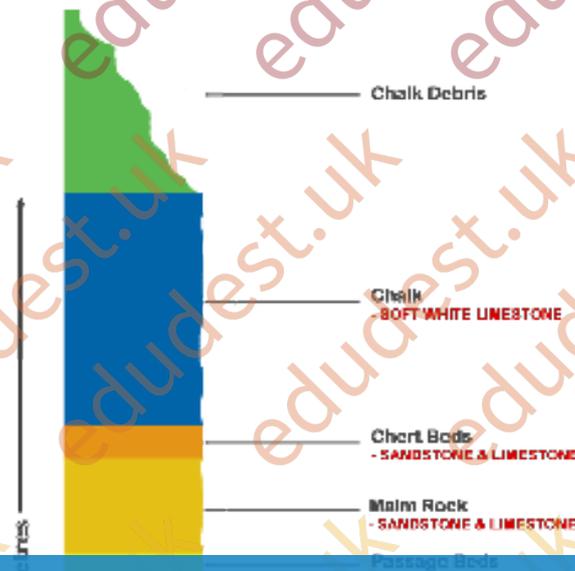
At these times, major changes in climatic conditions and sea level rise led to increased erosion and extensive land sliding in this area.

This left a legacy of highly unstable ground, prone to the reactivation events that we still see today.

The instability of the Undercliff area is controlled by its underlying geology. In this southern part of the island sedimentary rocks, formed between 120 and 80 million years ago (the Cretaceous Period), are composed of alternating layers of sandstones, clays and chalk (see diagram).

It is the clay that causes the weakness; clay is impermeable while the sandstone (sandrock) is permeable.

The area becomes unstable after very heavy or prolonged rainfall, especially during winter months, when the permeable sandstones become waterlogged. Water acts as a lubricant on which the impermeable clay can literally 'slide' and a landslide occurs.



Also, the rocks here dip gently seawards allowing gravity to 'pull' the rocks down. This is further exacerbated by water acting at the top of the Undercliff in unroofed areas causing undermining and further increasing instability.

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Life on the edge...

20 metres of land movement occurred along Undercliff Drive, which links Ventnor and Niton along the Undercliff, in 2014 following extremely wet winter weather. The road remains closed at the time of writing while authorities decide how best to approach its future. A mudslide near St Lawrence had perviously closed the road for 18 months in 2001.

It's not only the coastal road that has fallen victim; retaining walls, underground services and buildings have all been damaged and/or lost. Over the last 100 years approximately 50 properties have either directly been lost, or



have had to be demolished due to ground movement, and it is estimated that over £3 million a year is being spent on management measures, or lost due to landslide damage.

So, why live here?

So, why would people chose to live here then?

Some locations are quite stable and ancient structures remain, such as the Old St Boniface Church in Bonchurch (left), whose nave and chancel date back to the 11th century.



The microclimate of the Undercliff has long attracted people. Facing directly south and backed by the high downs, the undercliff is considerably sunnier/warmer than the rest of the island and, indeed, most of the rest of the UK.



The climate is humid and with few winter frosts and snow is rare. Physicians in Victorian times recognised the climate here as beneficial to those suffering from respiratory diseases, and a chest hospital (pictured left) and several sanitoriums were developed in Ventnor.

The microclimate has also allowed many subtropical species of plant



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Getting under the Undercliff www.edudest.uk

The Undercliff is a 12km stretch. There is no 'one place' to go and see it all. Instead, it is well worth exploring a few locations along its length. Here are a few suggested locations, with some highlights of what you can see at each:

The Landslip, Bonchurch

The 28 hectare wooded slopes of the Bonchurch landslip are an SSSI (Site of Special Scientific Interest), noted for their biological and geological features. Ash, oak and beech woodland with unusual lichen species and ferns thrive in the Gault Clay on the upper landslide, and the lower portions of the landslip support a diverse community of acid-loving and chalk species. Major landslides in 1810 and 1818 are responsible for its current form. This quote, written by Thomas Webster in 1811, described the landslip scene:

'I was surprised at the scene of devastation, which seemed to have been occasioned by some convulsion of nature. A considerable portion of the cliff had fallen down, strewing the whole of the ground between it and the sea with its ruins'

This area was developed as a picturesque woodland walk in Victorian times.

Two rock clefts which follow joints in the Upper Greensand crags were made into paths with steps carved from the rock;

The 'Devil's Chimney' (pictured) and The 'Cleft'. Along with the 'wishing stone' (or seat) the landslip is a fascinating place to explore!



Ventnor

Experience the microclimate for yourself in Ventnor and see if you can find a wall lizard. A separate resource for Ventnor exists which gives you a lot of further information about the town.

St Catherine's Point, Niton



Due to the closure of the coastal road, the next easy place to access the Undercliff is at Niton.

St Catherine's Point can be reached along the coastal path from Reeth Bay in the east (pictured), or by walking down from lower Niton. It is a good place to stand along the coastal path and look inland to see the extent of the undercliff. A landslide here in 1928 led to 20,000 tons of rock falling and destroying the Niton to Chale road, which

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swirling currents and rocky coastline, it is easy to imagine why it was needed here. The *Clarendon*, sailing from the Caribbean, struck rocks in a gale and broke up in October 1836. 23 people lost their lives. The lighthouse began operation in 1840.

Now fully automated, the lighthouse still helps to keep ships safe, although thankfully modern technologies mean shipwrecks are a rare occurrence.



Blackgang Chine

A viewpoint just above the roundabout at Blackgang Chine gives an excellent view of the very western end of The Undercliff, and gives a real sense of 'life on the edge'. The theme park sits precariously above the sliding land, and several now abandoned properties perch at the cliff edge.

