Introduction

In 1839, there occurred the greatest movement of land in our area, which reconfigured a massive portion of the coastal area between Lyme Regis and Seaton.

In 1841 William Dawson created a geographic 3-D model of this Great Landslip. He was a local civil engineer and surveyor, who used his measurements to make the model which he had taken for *Ten Plates*, his joint report of the event with William Buckland and William Conybeare (Conybeare, Dawson, Buckland, Mary and Buckland, W 1840).
Dawson’s Plan of the Bindon Landslip from the *Ten Plates of 1840*. By comparing the later large map on the wall in the Museum’s Undercliff Gallery, and the brilliant three dimensional model close by in the Landslip Gallery, you can visualise how this landslip - from the farmland at Bindon and Downlands to the shoreline - changed everything in a matter of days to the famous landscape of the Undercliff that we know today. The changes were not only physical, but social and historic as well.

Extract from the large map of 1841 of the Undercliff on the Gallery wall

The red line is the Preventative Service’s Coast Path as it was then

Until the landslip, most of the land to the west of Rousdon was pasture. Indeed, the ground on what is now the Undercliff was very fertile and had supported market gardens and grazing for cows, sheep and pigs. There were orchards and a managed hazel coppice. Farm labourers lived in cottages, coming and going along the track from the Dowlands Lime Kiln.

**So what happened to cause this upheaval?**

Various signs of the impending landslip began about two weeks before Christmas 1839, following six months of unprecedented rain. Settlement cracks began to appear on newish cottages in the Undercliff; fissures began to open on the cliff top, and at 3.00am on 24th December, crashing noises were heard by a family living about half a mile from the cliff edge. At 1.00am on Christmas Day, William Critchard, a labourer, who lived in the vicinity, was returning to his cottage. As he had been to the Ceremony of the Burning of the Faggot at
a local farmhouse, he was somewhat the worse for wear. Retiring to his bed, he ignored the signs that the house was beginning to crack.

Jackson (1999) summarised the long contemporary account given by Roberts (1840) as:

**The Bindon Landslip of Christmas 1839 in the Parish of Axmouth.**

At 6am that morning [24th December] William Critchard went up to work at the farm. His wife joined him and other estate families in the evening to celebrate Christmas Eve at the farmhouse in the old style with the burning of an ashen faggot. They all made merry round the master’s hearth until one in the morning. Returning to Rock Cottage, they noticed the path had dropped a foot since 6am. A relative looking after their children said she and their neighbours were alarmed and thought there “was something coming upon them”. The house was showing more serious cracks. Critchard, drunk from the recent festivity, entertained no fear.

After comparing Critchard’s state to that of Tam O’Shanter, *wi’ tippenny* [brandy] and *wi’ usquabae* [whiskey] we fear nae evil, Roberts continues the story:

*He and his wife went to bed. The house continued cracking a little. At about four o’clock he was roused by a “wonderful crack;” at five he said he would lie no longer; rose and found the garden had fissures in it. He used a stick to open the door, got out and called to his neighbours that the house was going. His neighbour began to take down a new clock; but a large joist had settled upon it which prevented him, till great force was used in raising the joist…the land continued cracking all the while.*

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*The seaward ridge and the “natural harbour”*, engraving by G Hawkins Jnr 1840 published undated for the tourist market by David Dunster, Lyme Regis
Later on Christmas night, two Preventative Men (from HM Coastguard anti-smuggling service) were down at Culverhole Point, where they noticed cracks and fissures opening up, and later, two others saw the sea boiling and roaring. The men were horrified to see the beach on which they stood rising and falling, and terrified when a dark wall of shingle emerged from beneath the sea.

In the morning, the destruction of the landscape was there for all to see. Eight million tons of cliff rock had broken off and slid seawards, forming The Chasm of twenty acres behind, forming (between the chasm and the sea) an ‘island’ of fifteen acres, a mass of Chalk and Greensand, which became to be known as Goat Island.

The ridge of shingle, which had so amazed the Preventative Men, rose to a height of forty feet, enclosing a lagoon-like feature, almost a natural harbour, but this was soon eroded away by the sea.

There were many theories as to what had caused this upheaval. Some thought it was the work of rabbits, burrowing into the ground; others that a dormant volcano had erupted, but many thought that it was the mark of the wrath of God.

So what was the actual cause?
It was caused by the particular geological structure of the area. After the six months of non-stop rain, water sinking through the top permeable layers (the Chalk and the Greensand Cherty Series) gathered in the lower part of the Greensand, which is a permeable, soft sand known as the Foxmould. This was because the next layer down, the Gault, although thin, is layer of clay impervious to water penetration.

When wet, the Gault Clay expanded and it became very slippery, providing a lubricated surface on which the whole mass above slid forward under gravity towards the sea as a single block of land. This slide was aided by the gentle south-eastern seaward slope of the strata.

The Chasm opened up this behind this block, bounded on the landward slide by a new line of cliffs. In the Chasm and along the seaward edge of the main block the layers of chalk and chert fractured and rotated by tipping backwards inland. The immense force of this sliding mass rucked up the beach, together with material from previous slips which had collected along the old line of the sea cliffs, creating the vast shingle bank seen by the men.

To make things worse, the Foxmould sands are both permeable and ‘friable’, ie, crumbly, not solid. When saturated with water under hydraulic pressure a point was reached when the Foxmould could no longer bear the weight of the overlying strata. Some of it collapsed, flowing out as fans of the semi-liquid known to engineers as “running sand”.

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Lyme’s History in Museum Objects 12: The Undercliff Model
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Sketch section from North (land) to South (sea) through the Bindon Landslip redrawn by Gallois 2010 from the Ten Plates of Conybeare et al. 1840. The dark band at the top is Chalk, the white band is Greensand and the dark band below is mainly clays with the thin slippery band of Gault at the top. Precise details will always remain conjectural without drilling and geophysical investigations.

The first major landslip reported scientifically
Fortunately for posterity, there were two very eminent geologists on the spot to record the events and to ponder on the reasons. They were William Buckland and William Conybeare, and they enlisted the support of a local civil engineer and surveyor William Dawson to prepare a detailed map and sections of the slip and William’s wife Mary to sketch the views (Conybeare, Dawson, Buckland, M. and W. 1840). Dawson was therefore the perfect person to convert the report into the three dimensional model which is in the Undercliff Gallery in the Museum today. As it happens Buckland and Conybeare’s explanation of the mechanism as a gravity-powered block slide on a bed of slippery strata, with minor rotational slipping around the edge, is the explanation still favoured by geologists.

The Chasm and Goat Island – detail from the model.
The sea is bottom left. Note the severed hedges on Goat Island and the broken ground in the Chasm and in front of Goat Island.
But that is not quite the end of the story – the Aftermath

In September 1840, two fields of corn and one of turnips already sown grew on the portion of land which had fallen from the fields above. This caused a sensation throughout the land, and 1,000 people and more came to visit, when a ceremony to cut the corn was arranged. It was called ‘The Wonder of the Age’ - perfectly attuned to the coming fashion for “Gothic” landscape, “most sublime”.

A detailed description of the event and watercolours depicting it may be seen on the walls behind and beside Dawson’s model. With this huge influx of visitors, the farmers began to sell dinners, teas and lemonade soda. They also charged 6d apiece to walk across the fields.

Landscape change continues

The change began with dramatic action by the forces of nature. What had once been managed farmland became colonised by self-sown ash woodland. Old Man’s Beard grew across the tops of the trees. It became almost a jungle landscape. Walking there today on the South West Coast Path, it is easy to become disorientated if you lose sight of the inland cliff. Some parts are virtually impenetrable.

Since 1955 it has been a National Nature Reserve. The ‘Island’, or Goat Island, has reverted to grassland but only maintained now by mowing, now that grazing is not possible. The old field systems are still visible with hedges of maple, holly and hazel. There are swathes of wild flowers in the spring (Franks 1989). Indeed, the Undercliff has a microclimate of its own, with primroses blooming as early as the second week of December. Access to the Island itself however, is restricted to the times when the Natural England wardens lead guided walks or volunteering parties (Campbell 2006).

In 1969, John Fowles, the author, who made his home in Lyme Regis, published a novel called ‘The French Lieutenant’s Woman’ (Fowles 1969). It was set in the town and when it
was later filmed, the Undercliff was a vital feature, as it had been in the book. Central to the story, the film brought the beauty and tranquility of the Undercliff to a wider audience.

A magical place, halfway through on the path to Seaton, you reach Ravine Pool, which has a strange and mysterious feel to it, like a Pre-Raphaelite illustration to a dark poem. No longer farmed as of old, it is now a place of leisure for everyone, naturalists, walkers and birdwatchers and it draws geologists from all over the world. But to have a true overview and understanding of the enormity of what happened on Christmas Day 1839, look first at the Dawson Model.

For more information see the displays in the Museum and:

♦ Campbell, Donald, 2006. Exploring the Undercliffs Wareham Coastal Publishing.
♦ Jackson, Peter, 1999 the Famous Landslip of 1839 between Lyme Regis and Seaton: a Great Landslip which became known as ‘The Wonder of the Age’ Watching Stone Books Axmouth.
♦ Roberts, G, 1840 An account of the mighty landslip of Downlands and Bindon, near Lyme Regis, 25th December, 1839 Dunster Lyme Regis.

For technical reading see:
♦ Conybeare, William; Dawson, William; Buckland, Mary and Buckland, William, 1840. Ten Plates, comprising a plan, section and views...representing the changes produced on the Coast of East Devon on 26th Dec 1839 and 3rd Feb., John Murray, London.

♦ Available to buy in the Museum shop.
♥ Inspection copy in file pocket in Landslip Gallery, often for sale second hand at Sanctuary Books, Broad Street.
♦ Extracts on display. Original copies are very fragile and can only be seen by special request.
♣ In the Museum’s collection: copies can be downloaded from other web sites (can be found using Google).

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