

Geotrail across Newborough Forest to Llanddwyn Island

Enjoy the fascinating geology and the magnificent views on this beautiful and spectacular walk in south-west Anglesey.

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Pictures: J. Conway, unless stated otherwise



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Llanddwyn Island is a magical place, best seen on a stormy day with the waves raging against wet rocks resplendent in a range of hues. On a hot sunny day, it feels like an island in the Aegean! This area records an entire plate tectonic story, from the creation of the ocean floor as a mid-ocean ridge, seen here as pillow lavas, through its journey across the ocean basin where it picked up sediments, to its burial and metamorphism as plates collided and the rocks sank down into a deep ocean trench.

- Leave the **Forestry car park** **1** and go on the **forest track** to **2** on the map. Here you join part of the post-marked Forestry geology trail (look out for Geo posts 5 to 10) where you can see green and purple banded cherts (Geopost 5), spectacular pillows with varying stages of limestone alteration (Geoposts 6, 8, 9, 10) and one pillow (Geopost 7) looking as



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fresh as when it was extruded on to the sea bed nearly 600 million years ago.

- Walk back to the **forest road**, turn right and after a short distance, cross the clearing on your left and observe the newly exposed pillows on the beach **3**. At **4** are the world famous lavas which erupted on to the ocean floor, piled up as separate “pillows”, with each draped over the rounded top of an earlier one. They mark the opening of an ancient ocean. Later Earth forces tilted all the pillows on their side with the uppermost (youngest) facing south-east.

- Cross to the **steps** **5** where the rocks are a mass of purple and green fragments – the result of an explosion as red hot lava forced its way through the Earth’s crust, met the icy cold seawater and shattered like shrapnel now surrounding small blobs of lava. Following this

explosive beginning, lava was then able to flow on to the seabed as pillows, like toothpaste being squeezed out of a tube.

• **Climb the steps** and follow the path to the **cattle grid**, turn right and go down to the beach via the **small gate** **6**. To the right of this sandy inlet are thinly-bedded, smooth sedimentary rocks (now almost vertical), originally fine muds on the deep ocean floor.



6 Deep ocean muds



View over location **7**



7 Detail of jasper and mudstone



9 Altered Pillow lavas mixed with limestone in Porth Twr Mawr



10 'Melange' of red chert, pink and white quartzite and (in background) green schist, intruded by later dyke

• Now proceed to the **grassy area above** **7** and peer over the rocks below – do not climb down, it's too steep. Here are alternate bands of bright green and red rocks – the green is from the later metamorphism of the muds, the red is jasper, an iron-rich silica, typical of deep oceans.

• As you pass the **Cross**, the cliffs to your right are limestone mixed with fragments of pillow lavas (better seen in the cliff below the **old lighthouse**) **8**. In the middle of this bay, an **isolated block of rock** **9** shows various types of altered pillow lavas amid red jasper and green chlorite-rich material (altered mudstone).

• The jewel in the crown is in **Porth Twr Bach** **10**. It is a simply amazing mixture of colours and textures, the "melange" of Edward Greenly, the geologist who first described them. Deformation, chemical alteration and metamorphism show that these ocean floor rocks were dragged into a deep ocean trench as one plate collided with, and dived beneath, another plate. More recent Earth movements split the mélangé and filled the cracks with lava (dolerite dykes).

• Return via the **Pilots' cottages** **11** and view the display, then follow the **main track** back past the ruins of the medieval St Dwynwen's church and field system. Small paths to the right, overlook raised beaches **12** that formed as the land rose after the Ice Age. Keep to the paths to avoid damaging the fragile sand-loving vegetation or disturbing ground-nesting birds in spring and early summer.



Llanddwyn lighthouse