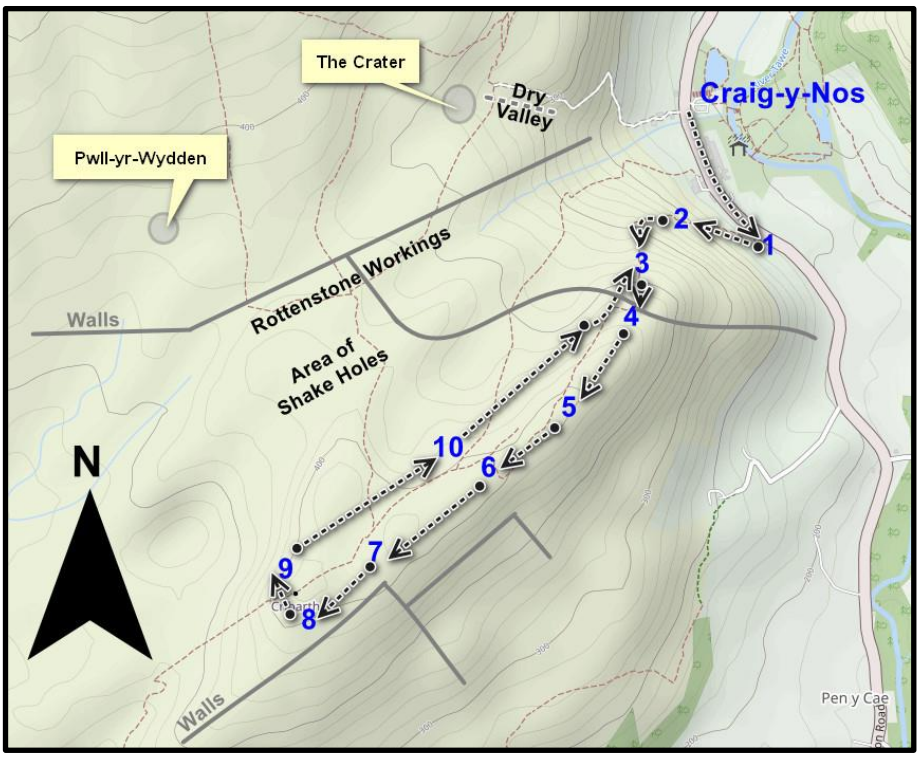
Geological Walks in Wales - Cribarth to Craig-y-Nos



Basemap © OpenStreetMap contributors

Cribarth lies north of the upper Tawe (Swansea) valley. Its summit, reaching 428m, is a quarried plateau. This walk of about 6km climbs steeply to loop around the plateau, looking at rocks, fossils and scenery. The walk takes at least half a day. Walking distance: is approximately 4km.

Location: Parking is available at Craig-y-nos Country Park off the A4067, 40 km NE of Swansea, grid reference SN 8400 1554, Post Code SA9 1GL.

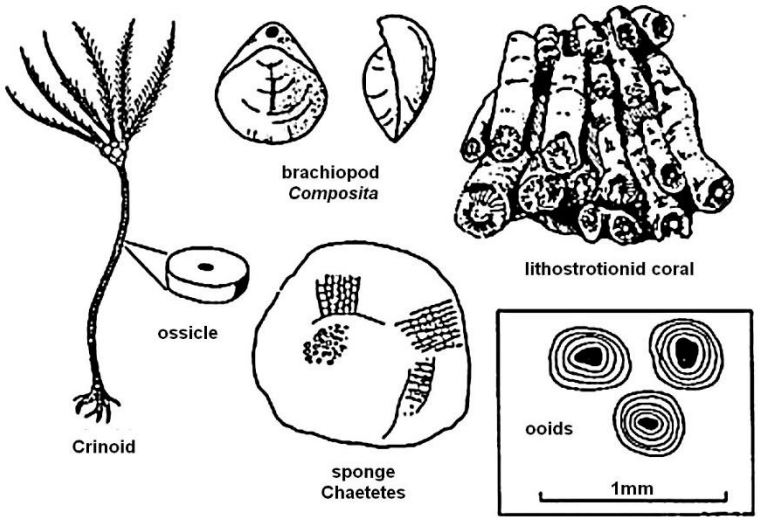
Maps: Ordnance Survey 1:50,000 Landranger Sheet 160 (Brecon Beacons) and 1:25,000 Outdoor Leisure Sheet 12 (Brecon Beacons West and Central); British Geological Survey 1:50,000 Sheet 231 (Merthyr Tydfil)

Caution: The path is steep at first, but well-marked. Beyond the stile (Locality 3) the terrain can be confusing in poor visibility: take a map and compass and know how to use them. Beware of steep edges in quarries.

Turn left from the car park onto the road - beware traffic. Continue for 400m, past Craig-y-nos Castle and the Coach House. Turn right at a gate marked "Geological Trail".

Locality 1. The Craig-y-nos Quarry Heritage Trail follows an old tramway. By the gate are examples of the main rocks in the area: **Old Red Sandstone** is made of sand and pebbles cemented together; the Carboniferous aged limestone is grey, with white, crescent-shaped fossil shells; **Marros Group** (formerly called the Millstone Grit) has round, creamy coloured pebbles cemented together.

The stones on the path are limestone, made of pieces of fossils cemented together. The fossils include brachiopods, corals and crinoids that lived in a warm sea that covered southern Britain in the early Carboniferous period of time, some 350 million years ago - long before today's hills and valleys formed.



The British Isles were then south of the equator: continental drift has since moved them northwards.

Look closely at the limestone - a magnifying glass is useful. Some pieces are made of tiny circles, less than 1mm across, called ooids. They formed as a coating of lime around a shell fragment or silt grain in shallow, turbulent water - they are not fossils. The rock is called oolitic limestone.

Take the path marked "Geological Trail". It is marked by white posts. After 400m, stop at a crest with crags of limestone, at a point near a fence where there is an open view.

Locality 2. Across the valley is a limestone quarry at Penwyllt. Higher ground to its right is made of Marros Group, which overlies the **Carboniferous Limestone Supergroup** - it formed later, and is younger.

The layers - beds- of rock are typical of sedimentary rocks, that built up on the sea-bed over millions of years. The beds were once horizontal and covered a vast area. They are now tilted (dip) to the south, and erosion has carved out the landscape.

Across the valley, Marros Group dipping to the South

Notice the scarp-and-dip features - gentle slopes dip towards the south, following bedding surfaces, while slopes facing north are steeper, cutting across the bedding. Higher ground left of the quarry ends in a wooded cliff above the Country Park - Craig y Rhiwarth.

The Brecon Beacons are underlain by Old Red Sandstone, that is older than Carboniferous Limestone supergroup. To the north-west the Marros Group has scarp-and-dip features like at Penwyllt. In between is the Carboniferous Limestone Supergroup. The buildings left of the road are Dan-yr-ogof, with its caves and imitation dinosaurs. Closer to you, on the extreme left, is a steep-sided valley with a large saucer-shaped depression, called "The Crater", near its head. There are smaller depressions to its right.

The Crater and shake holes where Marros Group has collapsed into caves in the limestone. Ditches in the foreground are Rottenstone workings

These features formed by weathering of the limestone. Acidic rain and water that has picked up acids from decaying plants in soil can dissolve and widen cracks in limestone. Eventually streams flow underground in cave systems like Dan-yr-ogof, leaving dry valleys at the surface. The circular depressions are shake holes (dolines), formed by collapse above a cave. The largest ones are where Marros Group roofs over large limestone caves before collapsing. Marros Group crags can be seen in Pwll-yr-Wydden shake hole above and to the left of The Crater. At the end of the last Ice Age, 11,000 years ago, the ground was frozen: glacial meltwater could not enter caves, but carved out the steep-sided valleys.

Look across the valley at Craig y Rhiwarth, above the Country Park. Its gently sloping surface follows bedding in the limestone, but beds in the crag itself are vertical. The limestone was bent (folded) into an arch (anticline) before erosion took place.

Bearing Left, continue upwards; and up to the stile.

Locality 3. There are many fossils in the limestone blocks of the wall - do not collect from these! There are also blocks of red rock: these are erratics of Old Red Sandstone, carried here from the north by ice during the last phase of glaciation, about 22,000 years ago.

Cross the stile. Walk uphill away from the wall towards a rocky knoll on the skyline.

Old Red Sandstone blocks stand out from the grey limestone in the wall

Locality 4. These pale crags have rounded, fluted surfaces. They are natural limestone pavements, formed by solution of the limestone when it was covered by soil. Notice that the bedding here is nearly horizontal.

Bear left. Cross the low edge of an old quarry. Follow the quarry floor to a level path.

Locality 5. This path follows the line of a tramroad, built in the 19th century when there were over 30 quarries on Cribarth. Limestone was taken to the Swansea Canal at Abercrâf for agricultural use and later for the iron industry. Fossils include sponges - large oval shapes with a delicate, cell-like structure. Bedding is tilted steeply to your left (south. There are blocks of brown sandstone that were discarded during quarrying. Sandstone beds within the limestone were deposited by rivers during the Carboniferous period when sea-level fell, forming islands like the Bahamas today.

View into the Quarry locality 6 is at the far end

Locality 6. Above you and to the right are the old quarries (optional diversion) where you can find many hand sized pieces to inspect with a magnifier.

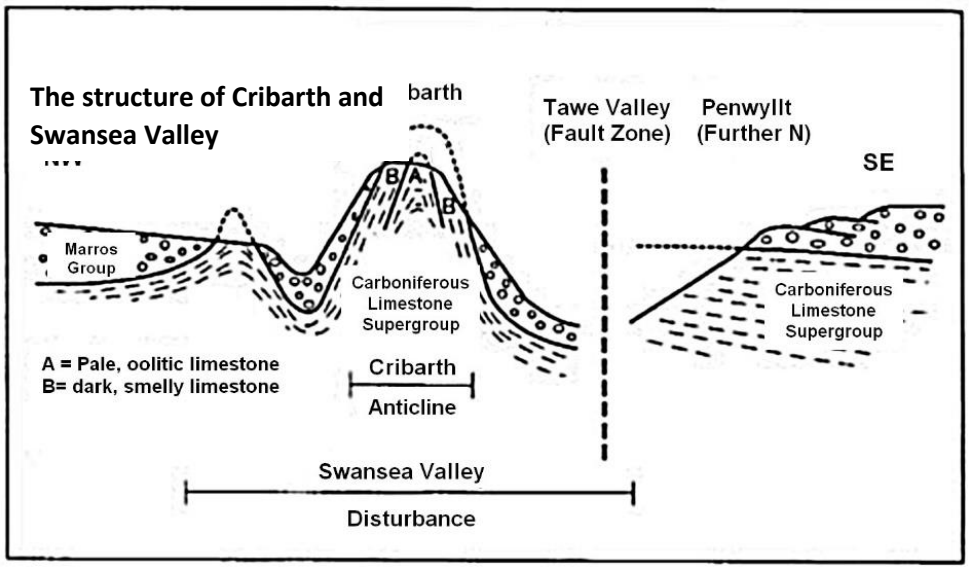
Take Great Care if you enter the quarry because the rocks underfoot are very loose.

North-west dipping strata seen by looking back from locality 7

Return to the Path and head SW; after 1 km, stop by a stone wall.

Locality 7. The tall crag ahead, near the corner in the wall, has bedding dipping away from you - towards the north-west. This is even more clearly seen by looking back towards the north side of the crags you have walked the south side of. Along the path beds were tilted to the south-east, while on the summit plateau they are horizontal. Limestone beds on Cribarth form an arch - anticline - that has been cut through by erosion.

The Cribarth Anticline continues the fold on Craig y Rhiwarth (Locality 2) and is part of a narrow zone of bent and broken rocks called the Swansea Valley Disturbance.



If you knock together pieces of limestone here, they make a sulphurous smell, caused by the decay of organic material. Related processes result in the formation of crude oil. Pale, oolitic limestones form the eroded core of the anticline: they underlie and are older than the dark, smelly limestones on the ridge flanks. Hard, pale lumps in the limestone here are chert, made of silica that grew chemically in the rock, like flint nodules in the Chalk of southern England.

In some places chert grew as tiny crystals: weathering dissolved the limestone, leaving a porous rock called rottenstone, that was quarried as a polishing agent (see Locality 8). You can also find white, glassy crystals of calcite, the crystalline equivalent of limestone, which grew in cracks in the limestone.

*Turn left at the corner in the wall. Ahead to the right it is an easy ascent to the **triangulation pillar** at the summit (423m).*

Locality 8. The Swansea Valley is in line with the ridge of Cribarth, because erosion has picked out weaker rocks along the Swansea Valley Disturbance. The valley has steep sides and a broad floor, typical of erosion by glaciers. During the last phase of glaciation, 22,000 years ago, a glacier flowed from the Brecon Beacons along the Swansea Valley.

Walk north for about 50m across a damp hollow to a mound with small crags.

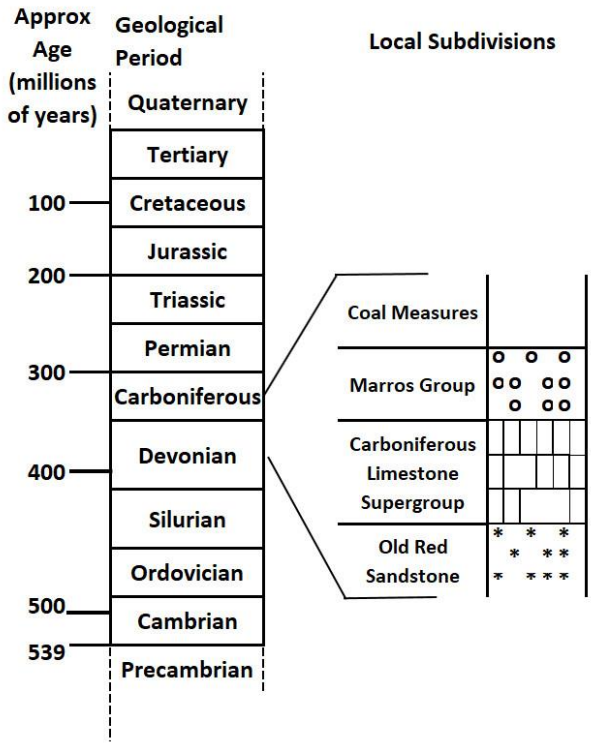
Locality 9. These crags are quartzite - cemented pure sand. They belong to the Marros Group, which overlies the limestone. It formed when sand and pebbles were washed into the area about 320 million years ago, starting the delta conditions of the late Carboniferous South Wales Coal Measures Group. Most of the boulders at Locality 8 were Marros Group, including pieces of conglomerate - cemented pebbles.

North from here you can see Pwll-yr-Wydden (see Locality 3). Dark, lumpy ground to its right is where rottenstone was quarried in the 1820's. The ditches between Localities 8 and 9 may be trial pits for rottenstone.

The Marros Group here is tilted steeply to the north-west. Across the valley below you can see bedding surfaces sloping towards you. This valley follows another fold - a downfold or syncline - running alongside the Cribarth Anticline. Limestone areas are well-drained, with short grass and thin soils, whereas Marros Group ground is poorly drained, with peat and ponds.

Make your way back along the tram road which runs along the north-west side of the Cribarth plateau

Locality 10. Looking North you get another view across the area you saw at Localities 3 and 9. You can see many of the shake holes described previously.



Tram road and path leading up and back to locality 4

Continue along the old tram road follows the north-west edge of the plateau, ending after 1 km. As the level path runs out, follow a path which rises to the right then runs level (in the area of Locality 4) and drops to a stone wall. Turn right to reach the stile (Locality 3). Cross this and retrace your steps to the Country Park.

Produced by the Geologists' Association South Wales Group, Updated 2022 from an original leaflet by Dr. Geraint Owen 1998.

Follow the Country Code and the Geological Fieldwork Code. Do not cause damage. Do not stray from paths. Collect from loose material rather than from fresh rock