## Geological Walks in Wales -Pontneddfechan: The Afon Nedd and Sgwd Gwladus

This is an easy walk alongside the rivers Neath (Afon Nedd) and Pyrddin, which flow through beautiful wooded country. The main feature on this walk are the waterfalls. The rocks seen are sandstones, conglomerates and mudstones with fossils. They formed during the Carboniferous period of time, about 320 million years ago. South Wales was then a tropical coast, sometimes flooded by the sea. The scenery includes waterfalls, gorges and rapids.

**Location:** The walk begins at Pontneddfechan, which is 2km from the westernmost exit (Glyn-neath) of the dual carriageway on the A465 Heads of the Valleys Road. There is parking near the Angel Inn. The riverside path is entered through a swing gate behind the Angel Inn, grid reference SN 9006 0763, Post Code SA11 5NR.

**Maps:** The walk is covered by Ordnance Survey 1:50,000 map sheet 160 (Brecon Beacons) and 1:25,000 Outdoor Leisure sheet 11 (Brecon Beacons Central), and by British Geological Survey 1:50,000 Sheet 231 (Merthyr Tydfil).

**Walking Distance:** The route is 4km long and is a pleasant half day's stroll. Sections can be muddy underfoot and great care should be taken near the river and waterfalls

**Outline of the Geology:** When rocks of this area were formed, the distribution of land and sea was not as it is now. South Wales was part of a coastal plain, with land to the north and sea to the south. The area lay close to the equator: seas were warm and the coasts were covered by lush vegetation, much like present-day equatorial forests.

All the rocks on this walk are sedimentary rocks, which formed as mud, sand and gravel on the beds of rivers and the sea. As more



sediments were laid on top, older layers (beds) were buried and cemented to form rock. Mudstone formed as mud in quiet water, mostly on the sea floor. Fossils occur mostly in thin layers known as marine bands, or in non-marine

mussel bands, which represent coastal lakes. Sandstone and conglomerate were deposited as sand and gravel washed in by stronger currents. They represent times when sea-level fell, the coast built up and river deposits replaced the sea. The top surfaces of some sandstones contain fossil plant roots, showing that these river deposits became colonised by swamps.

The rocks seen on this walk belong to a group known as the Marros Group (formerly known as the Millstone Grit). They formed during part of the Carboniferous period of geological time, between 330 and 310 million years ago.

At the end of Carboniferous time, after the South Wales Coal Measures group had also been deposited (about 290 million years ago), the whole region was squeezed by plate tectonic movements, like those which have formed the Alps and the Himalayas. The rock layers became deformed and uplifted, and since then they have been being worn away. As a result, tilted beds are seen at the surface, with older rocks lower in the pile and younger ones higher up.

The older part of the Marros Group is called the Twrch Sandstone (formerly known as the Basal Grit). Here this is 80m thick and comprises mainly hard, quartz-rich sandstone and conglomerate. The

![](_page_1_Figure_5.jpeg)

younger part is the Bishopston Mudstone Formation (formerly known as the Shale Group), 80m thick and made up of mudstone with a few thin sandstones, notably the 'Twelve-foot Sandstone' and the 'Cumbriense Quartzite'. The Bishopston Mudstone Formation is overlain by a thicker sandstone the 'Farewell Rock', which represents a prolonged period of coastal plain conditions. This marks the base of the South Wales Coal Measure Group.

The last 2 million years have been a period of alternating ice advance and retreat across Britain. Rivers have been provided with renewed vigour for cutting their valleys and the Rivers Neath and Pyrddin flow in deep, steep-sided, sometimes gorge-like clefts. In detail their course is closely related to the geology, which explains the positions of waterfalls and rapids.

Locality 1. 50m from the swing gate hard sandstone and softer mudstone are exposed alongside the track. They belong to the 'Farewell Rock' and are clearly layered: the beds tilt (dip) towards the south. The track follows the line of a mineral railway and the rock has been blasted to make a cutting - you can see the ends of old drill holes.

Locality 2. An overhanging cliff near the base of the 'Farewell Rock' . On the underside of the main overhang you may make out ribbed oblong markings. These are fossil logs (Calamites) and represent a log jam in a river channel.

From here, a path on the right leads back from

![](_page_1_Picture_10.jpeg)

Fossil logs at Locality 2 viewed from below so you don't have to! the main track to where the river enters a narrow gorge as it flows onto harder rocks.

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The 'Farewell Rock' forms a small overhang and overlies softer, dark grey mudstone, the Subcrenatum Marine Band. It is named after a goniatite (*Gastrioceras subcrenatum*), one of the kinds of fossil shells found in it, which are extinct sea creatures related to octopus and squid. The 'Farewell Rock' represents a period when sea-level fell and the sea was replaced by a coastal plain. On the opposite bank it shows cross bedding: layers are tilted relative to the bedding, representing sand washed over the front of an underwater dune. This shows that currents flowed from north to south.

**Locality 3.** Continue on the main track for 50m alongside a cliff of 'Farewell Rock'. A minor path opposite a wooden bench leads to rocks by the river. This rock is quartzite - a pure, hard sandstone - and this is one of the sandstones in the Bishopston Mudstone Formation. Its base can be seen on the opposite bank, downstream of a stone abutment, abruptly overlying mudstone. Fossils from the mudstone include various sea shells (bivalves and brachiopods) and another kind of goniatite - *Gastrioceras cumbriense:* the quartzite is known as the 'Cumbriense Quartzite'. Where the minor paths meet the rocks, the beds are finer-grained, with thin dark mudstones rich in plant fossils. The 'Cumbriense Quartzite' represents another (earlier) episode when seas were replaced by a coastal plain.

![](_page_2_Picture_3.jpeg)

Carbonicola bivalves from locality 4

**Locality 4.** The main track is paved with stone sleepers, each with two holes where rails were attached. The 'Cumbriense Quartzite' is exposed above a broad cave on the left. 20m beyond a stile, the river bank is protected by a wall with rocks (slippery when wet!) exposed at its base.

They can be reached from here or along the river bank from locality 5. They are dark mudstones with abundant flattened impressions of *f*ossil mussels called *Carbonicola*. These were freshwater mussels and the rocks accumulated as muds in a coastal lake.

50m farther along the track, a bench is built into a low stone wall. The mudstones here are typical of the Bishopston Mudstone Formation. They rarely yield fossils.

**Locality 5**. The river narrows where it crosses another hard band of quartzite - the 'Twelve foot Sandstone'. Its top surface contains prominent cracks (joints). A shallow depression 5m long by 20cm wide is probably the cast of a fallen tree trunk. The river bank now opens into a broad grassy field. This is an old floodplain developed at a time before the river had cut down to its present level. The mudstones the 'Twelve foot Sandstone' can be seen in the cliff on the opposite bank.

**Locality 6.** 300m beyond locality 5 a ridge of hard rock nearly blocks the river, which flows through a deep, sheer-sided cleft. The hard white rock contains pebbles of quartz and is a conglomerate belonging to the Twrch Sandstone Formation. The sheer sides of this cleft mark the line of a fault, where the two sides once slid past each other.

**Locality 7.** Just beyond a wooden stile, a low cave on the left enters a flooded silica mine. Silica is the material of which quartz is made and the pure quartzites of the Twrch Sandstone Formation were mined to make bricks for lining furnaces. 70m farther along the track there is a brick-vaulted passage which is another mine - these workings are dangerous and must not be entered.

![](_page_2_Picture_11.jpeg)

Locality 6 Twrch Sandstone, Note the straight line on the left bank

Mudstone in the stream above quartzite yields fossils from another marine band, including a scallop-like bivalve called *Dunbarella*.

**Locality 8.** Follow either of two tracks across another broad level area, until some steps are reached. At the foot of these steps, leave the track and follow the river bank upstream for about 30m to some prominent crags. The rocks are conglomerate of the Twrch Sandstone Formation. Shallow depressions are the remains of plant fossils, such as stems, trunks and roots. Continue a further 200m alongside the river to rejoin the main track, or else return to the steps.

**Locality 9.** A metal footbridge crosses the Pyrddin where it joins the River Neath. Conglomerate of the Twrch Sandstone is exposed in the river banks. Continue upstream along the Pyrddin for 150m, without crossing the bridge. Small cascades mark harder beds, which now dip upstream: the rocks here have been deformed into a gentle arch (anticline). A prominent rib crossing the river obliquely is the top of the Twrch Sandstone Formation, forming a small waterfall. Above this the rocks belong to the Bishopston Mudstone Formation, like those seen at localities 2-5.

**Locality 10.** Steps lead to a viewing platform for Sgwd Gwladus. This graceful waterfall has formed where the River Pyrddin tumbles over a ledge of 'Twelve-foot Sandstone'. Mudstones beneath yield fossils. They have been eroded, so that the more resistant sandstone above forms an overhang. The towering cliff above the waterfall exposes more of the mudstone that dominates this part of the Marros Group.

**Locality 11.** Cross the river by stepping over some large stones, or use the footbridge at locality 9. The 'Twelve-foot Sandstone' can be seen in the face of Sgwd Gwladus, and in the crags to either side. Its base is sharp but undulating, indicating erosion of the sea floor before the sands were deposited. The path winds up the side of the waterfall to an open grassy area where the Rocking Stone a huge boulder of Twrch Sandstone

![](_page_3_Picture_6.jpeg)

Locality 11 Sgwd Gwladws with the "Twelve-Foot Sandstone" ledge at the top of the waterfall

Formation conglomerate – which no longer rocks.

*The track soon passes a ruined mill.* The millstones are made of Twrch Sandstone Formation (see locality 6).

**Locality 12.** Here, the top surface of the 'Twelve-foot Sandstone', a smooth, pale, hard quartzite, can be seen. Creamy patches are fossil roots, some of which can be recognised as *Stigmaria*. They show that this surface became emergent and was colonised by plants,

If you have time, the path continues for 1 km, criss-crossing the Pyrddin, to the tall waterfall of Sgwd Einion Gam, where the Farewell Rock is faulted against mudstone. Another path follows the River Neath past waterfalls in the Twrch Sandstone to Pont Melin Fach.

Retrace your steps to Pontneddfechan.

Updated 2022 from an original leaflet by Dr. Geraint Owen 1991.

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.