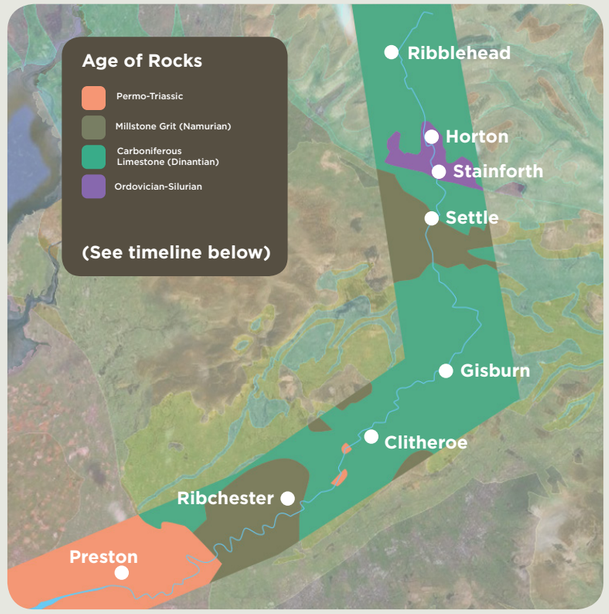
The Geology *How old are the rocks?*



The Ribble valley's oldest rocks are sandstones and limestones which were laid down 410-510 million years (Ma) ago in the Ordovician and Silurian periods. They have been affected by folding and faulting during their long history. Around Horton-in-Ribblesdale and Stainforth these processes uplifted the older rocks to the surface, where today they are quarried for roadstone at Horton and Ingleton.

Rocks of Carboniferous age (360-290 Ma) covered the older rocks and now dominate the landscape of the Ribble valley. The river rises in an area of the oldest Carboniferous rocks, the Craven limestones, which have given the Yorkshire Dales National Park its characteristic landscapes. The sink holes, caves and limestone pavements around Ingleborough, Whernside and Pen-y-ghent are produced by solution weathering of these limestones.

Overlying the limestone are Carboniferous sandstones, gritstones and finer-grained sediments of Namurian 'Millstone Grit' age (326–312 Ma). Erosion over millions of years has removed much of this rock to form the dark moorland landscapes of Bowland, Pendle Hill and Longridge Fell.

The youngest solid rocks are of Permian and Triassic age (290-205 Ma). These are also sandstones but mostly reddish in colour; they form the coastal plain of West Lancashire and the Fylde.

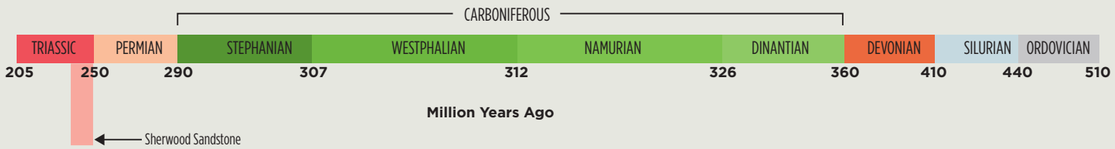
The most recent deposits are less than 25,000 years old. Thick layers of glacial till (boulder clay) can be found especially on the lower ground, while sands and gravels characterise the hill margins. Post-glacial deposition includes alluvium on the river floodplain, mud and sand in the estuary and blanket peat over the higher hilltops.

Millstone Grit (Gritstone), Rossendale

Gordale Scar

Limestone Pavement

THE GEOLOGICAL TIMELINE



GeoLancashire

Geolancashire is a voluntary organisation founded in 1991 to protect and raise public appreciation of the geology and landscapes of Lancashire. It has produced a number of geotrail guides and other publications for several sites across the county, details of which may be found on the website.

www.geolancashire.org.uk

The Geologists' Association (LGGA)

The Geologists' Association (GA) was formed in 1858, and actively promotes the study of geology to all who are interested in Earth Sciences. The Lancashire Group is a local branch of the GA which meets monthly in Clitheroe. It is an informal, friendly and inclusive organisation and welcomes members and guests regardless of their level of geological knowledge. It organises a programme of winter lectures and summer field excursions which are open to all. The group has very close ties with GeoLancashire and the two organisations have worked together on a number of projects in recent years.

www.lancashire-geologists.co.uk

The Ribble Way provides a ready-made excursion into many of the geological landscapes of Lancashire and the Yorkshire Dales. These short geotrails provide a way of exploring them. A geological guide to the whole route is planned for the future.

Walk 1 Preston

The Ribble Way

This Ribble Valley **Geo**trail Pocket Guide is just one of **5** pocket guides currently available or in preparation

1

Ribble Valley Geotrails

POCKET GUIDE

Walk 1 Preston

Details of these may be found on our website. We plan to produce a further five Ribble Valley geotrail guides for the section from Clitheroe to Horton-in-Ribblesdale and details will be available on the website as they are published.

This is a Quick Response (QR) code. When scanned with a smartphone (see below) it can link you directly to a page on the GeoLancashire website to provide you with more information about this walk. To scan a QR code you will need a smartphone or tablet with a camera and an 'app' to read the code. You will also need access to the internet on your device. There are many free QR scanner apps available. You can download them from sites like www.qrstuff.com and www.qrdroid.com

www.geolancashire.org.uk

GeoLancashire RIGS Group

Ribble Valley Geotrails

granite

Walk 1 Preston

There is little sign in Preston of the underlying rock, but careful examination of the river banks will reveal clues to the geological history of this area.

1 Penwortham Old Bridge is built from Fletcher Bank Grit of Carboniferous age, a coarse-grained sandstone from Whittle Hill near Chorley. This rock has large grains of quartz, indicating that it was laid down by fast-flowing water with the energy to move large particles. The deck is sett-paved with Haslingden Flags, also of Carboniferous age from the Rossendale area.

The bridge stands on an outcrop of Sherwood sandstone, a red coloured rock of Triassic age, 200-250 million years old, laid down in desert conditions not unlike those of the Sahara Desert today. The bridge design incorporates Sherwood Sandstone, the rock on which Preston is built. At low tide this rock is visible in the bed of the river, A river would not normally flow over solid rock so near its mouth and it appears that the last period of glaciation about 24,000 years ago caused a major shift in the river's course.

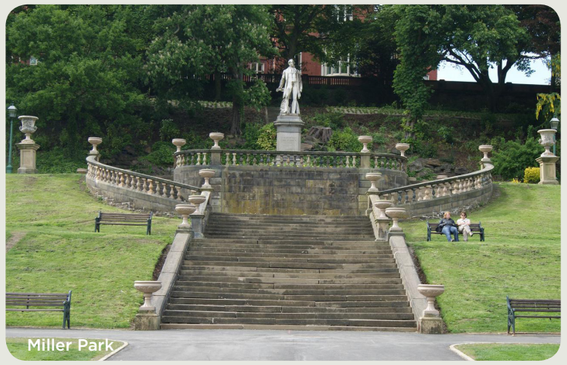
2 The railway viaduct, built in 1835, is constructed from sandstone ashlar of two rock types, Fletcher Bank Grit from Whittle Hill, Chorley, for the base of the piers and Pendle Grit from Longridge Fell

Penwortham Old Bridge

for the upper parts. Both rocks are coarse-grained sandstones of Carboniferous age. The later western extension is made from red Sherwood Sandstone of Triassic age.

The second bridge was built, from Pendle Grit and red brick, to carry the former East Lancashire railway but now carries a public footpath and cycleway over the river.

3 Walton Bridge carries the A6 road across the river. The bridge is built from two different sandstones. The older downstream side was built in the 1780s using Fletcher Bank Grit probably from the Chorley area - grey and very coarse with lots of big pebbles The western extension was built between 1939-1950 with arches of reinforced concrete, while the stone facings and parapet are made from Pendle Grit from Longridge, the stone used in many of Preston's public buildings.



Miller Park

Near the bridge on the south bank is a shingle bank, composed of pebbles of many different types of rock. These are glacial erratics left behind by ice sheets. You might be able to find pebbles of limestone – sometimes containing fossils, various sandstones, green volcanic rock from the Lake District and even some granite pebbles which have travelled between 50 and 100 miles from where they were formed in either SW Scotland or the Lake District.

4 Avenham Park has been an open space in Preston since about 1697. During the 1860s the American Civil War had a serious effect on the Lancashire cotton industry when the mill workers refused to spin cotton grown by slaves. A scheme to expand the park was undertaken to keep cotton workers employed.

Walk 1 Preston ROUTE 1

Start: Parking is possible for a small number of cars on Broadgate and Riverside on the north side of the river near Penwortham Bridge where the walk starts. This is about 10 minutes' walk from the Railway station.

Route: From the bridge, follow Riverside Road then the footpath upstream on the south side of the river. Pass under the Ribble Viaduct, over a footbridge and under the disused East Lancashire Railway viaduct. Keeping to the river bank, pass under the old tramway bridge and follow the bend of the river until the River Darwen is reached. Cross this at Flats Bridge and keep to the north bank until the Ribble is reached again and followed as far as the Bridge Inn where the river channel can be accessed.

Pass over Walton Bridge then turn left into Ashworth Grove, then Boulevard which leads to Avenham Park. The riverside path continues into Miller Park, back under the main railway bridge into Riverside and the start of the walk.

Distance: Approximately 6km (3.75 miles)

Maps: OS Pathfinder 1:25K Sheet 688; Preston A – Z street map.

The Boer War memorial dates from 1904 and is in obelisk form, 25 feet high, made from grey granite with polished red and pink granite and bronze plaques.

5 Miller Park is named after Thomas Miller, a mill owner who bought the land and gave it to the Corporation during the Cotton Famine. The park is laid out in a formal ornamental style with a fountain, steps, urns and a memorial, constructed from Portland stone and granite, to the 14th Earl of Derby who died in 1869. The park is dominated by a magnificent flight of steps made of Pendle Grit from Longridge Fell. Carboniferous Limestone from Westmorland forms a rockery in the Japanese Garden. Preston Council have a record of 400 tons of rock being sent from Milnthorpe in 1935 at 19s 6d per ton. This was probably another job creation scheme during the 1930s Depression. The limestone was formed in warm, clear tropical seas about 350 million years ago and

East Lancs Railway Arch

is made from the remains of marine organisms; if you are lucky you may find fossils of corals, crinoids and brachiopods. Beside the railway embankment is another rockery, made from dark red, coarse, Permian sandstone, probably from Penrith or Dumfries. This sandstone was laid down 250-290 million years ago in desert conditions.