

### Brief History of the Park

In the early 1800's the land which is now Prince of Wales Park and its surrounds was owned by George Lane-Fox of Bramhope and contained Brown Hill Quarry. In the 1861 Enclosure Acts the quarry (now disused) was part of a parcel of 400 acres designated as farmland and settlement. The quarry site was awarded to the Church Wardens and Overseers of the Poor in Bingley for garden allotments but was considered to be too poor for this purpose so in 1863 its designation was changed to become an area for recreation. Following a public subscription a further 8 acres were added to create a People's Park. On 10<sup>th</sup> March 1863 work began to lay out the park using (mainly) voluntary labour and as this was the wedding day of HRH Prince of Wales, it was named after him. To acknowledge this the Park received 50 trees from his Sandringham Estate. The Park opened on 6<sup>th</sup> June 1865 with the Park Lodge and gates added in 1870. In 1869 a trust was established to elect a committee to manage the park who determined that *'drinking, gambling, and Sunday games, together with the public discussion of politics and religion were not to be allowed'*. In 1880 the Bingley Market Hall was relocated from the town centre to the Quarry where it stood until being returned in 1984. The Cascades and other water features were added between 1956-76.

Although owned by City of Bradford Metropolitan Council much of the care and maintenance is now carried out by the Friends of Prince of Wales Park. It is listed Grade II by English Heritage on its National Register of Historic Parks and Gardens because of its special historic interest.

For more detail on the Park and its history see

<http://www.bingleyhistory.co.uk/PoWPark.html> Friends of Prince of Wales Park <https://www.friendsofpowp.org.uk/>



The drinking fountain and its inscription - a fun loving lot?



The Park Lodge and Gates



Bingley Market Hall located in the Quarry 1880-1984

### Geological References and further reading:

BGS 1: 50 000 (2000) England and Wales Sheet 69 Bradford. Solid Geology

BGS A Lithostratigraphical framework for the Carboniferous succession of Great Britain. Waters CN, Browne MAE, Dean MT, Powell JH Bristow, C.S (1988) Controls on the sedimentation of the Rough Rock Group (Namurian) from the Pennine basin of northern England.

Chap 11 p114-131 In Besly, B.M. and Kelling, G (Eds). Sedimentation in syn-orogenic basin complexes: the Upper Carboniferous of northwest Europe

Yorkshire Rock. Bell R Earthwise

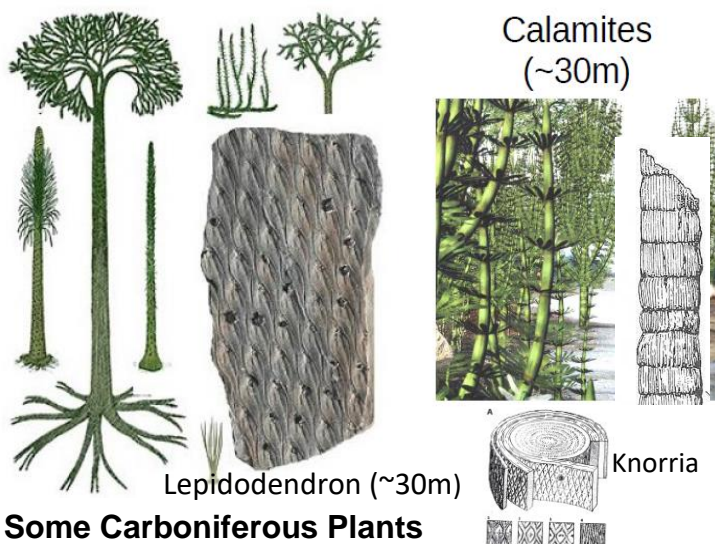
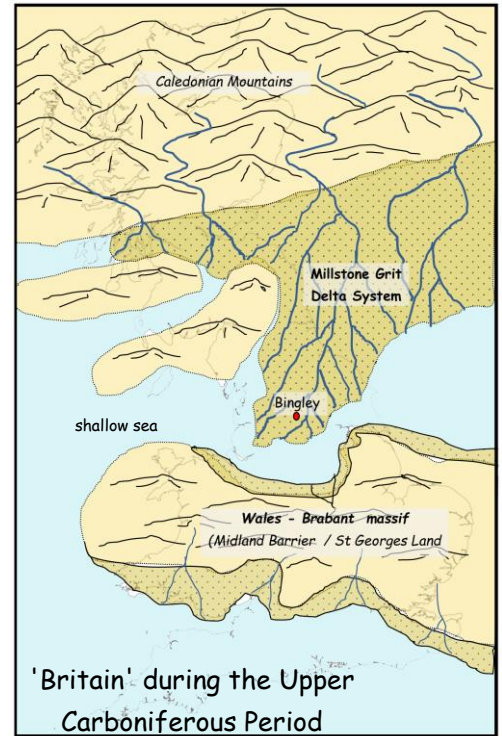
Leeds Geological Association: [www.leedsga.org.uk](http://www.leedsga.org.uk)



## Prince of Wales Park: Geological History

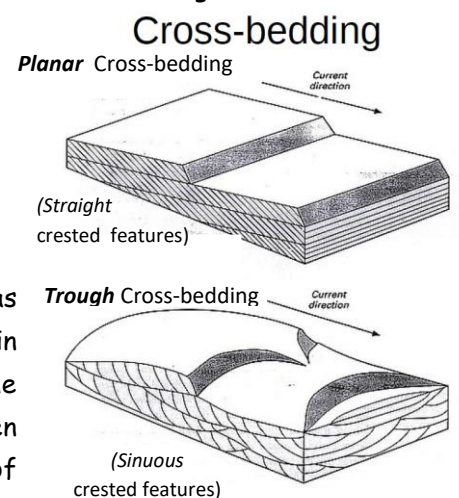
The history of the Park goes much further back than its opening in 1865 as the rocks that were quarried here were formed over **300 Ma** when the world was a different place. The area that was to become Bingley was situated over the equator and covered by a shallow sea into which vast river systems, flowing from a mountain range to the north, were depositing huge amounts of sand and mud, building up a large delta system. This period of time is part of the **Carboniferous Period** and the rocks that the sediments became are known as the **Millstone Grit Group**.

The rivers flowing through the deltas were constantly changing course as they rose and fell in response to the volume of water they carried so the type of sediment being deposited in any one place at the same time varied. In the main channels, where the currents were strongest, the only sediment that could settle were pebbles and coarse sands. On the channel margins or inside of bends, where currents were more gentle, finer sands settled. Rivers would frequently burst their banks and flood the flat delta tops and in these places silt and mud settled in temporary lakes. Under the hot wet the hot, wet climate the swampy ground of the delta tops quickly became covered in vegetation. This was rarely able to survive long as it was repeatedly covered or washed away by floods, only to re-grow as waters subsided. Because the sea floor was gradually subsiding a huge thickness of sediment (max ~1800 m) accumulated between 326 -313 Ma but what is seen in the Park is the very top (youngest) part of it. This is the **Rossendale Formation** which consists of dark mudstones overlain by two different sandstones. Being soft the mudstones don't outcrop here but the sandstones do. The lower ones, the **Rough Rock Flags**, are fine to medium grained, micaceous and occur in thin layers and were deposited as sand bars at the mouths of distributary channels. Above these is a much thicker, harder sandstone, the **Rough Rock**. It is between 12 - 45 m thick but is always a coarse to very coarse grained **sandstone** made up of *poorly sorted* (its grains vary in size), *angular grains* and displays *graded bedding* (within a layer grains are arranged by size; the largest ones at the bottom). These features, as well as the presence of large amounts of the mineral **feldspar**, all point to a sediment, which has travelled only a relatively short distance (& time) from its source and which has been deposited rapidly from fast flowing currents which have been suddenly checked. Another distinctive feature of the rock is the pattern of its layers. These are rarely uniform in thickness and lie at different angles which show the direction the currents flowed. This is known as **cross-bedding** and was formed as the sand was deposited as dunes and sand bars in a main river channel. The whole sequence represents the advance of a delta into a shallow sea. Being thick and hard the Rough Rock forms prominent outcrops where ever it appears at the surface and can be traced across a wide area of northern England, outcropping from Rossendale in the west to Leeds in the east and Derby in the south.



Some Carboniferous Plants

That the delta top was at times covered in forests is shown by the many plant **fossils** seen in rocks lining many of the paths. These are impressions of trunks and stems of trees, giant ferns and mosses that grew on the banks of the river channels and in delta top swamps. Washed away by floods, they were carried downstream to become stranded and then later, buried by sand. The wood rotted away but the impressions of the bark became preserved in the sediment as it turned to rock.



1. **The Quarry.** Coarse grained, poorly sorted, angular, *feldspathic sandstone* makes up the main face; this is the **Rough Rock**. The beds in the quarry face are very thick and display large scale *trough cross-bedding*. Many layers show *graded bedding* and some contain thin layers of organic matter. These beds are characteristic of having been deposited during flood events as subaqueous dunes or sand bars in fast flowing, braided river channel flowing across the top of a delta. The tough nature of the rock and the massive bedding made this a good *dimensional stone* however there are places where a high percentage of iron in the cement has caused it to weather easily. These patches were known as 'mares' by quarrymen although they did have use as 'donkey stones' for scouring doorsteps. To the left of the main face, behind a retaining wall made of mixed, dressed stone, the rock has very different characteristics. The beds are much thinner, evenly bedded and of fine grained *micaceous sandstone* separated by layers of *siltstone*. The abrupt change shows that a **fault** runs through here which has brought different rocks to lie adjacent to each other. These are the **Rough Rock Flags** that are *older* than the Rough Rock and should lie beneath it. This rock is not a good dimension stone and is probably why the quarry was abandoned.

2. **Steps out of Quarry.** These rock faces display varied styles of cross-bedding in the **Rough Rock**. The rock texture is still the same as that seen in the main face in the Quarry but the beds show examples of smaller scale trough cross-bedding as well as planar cross-bedding. This is not unusual given the braided nature of the river channels that they were deposited in.

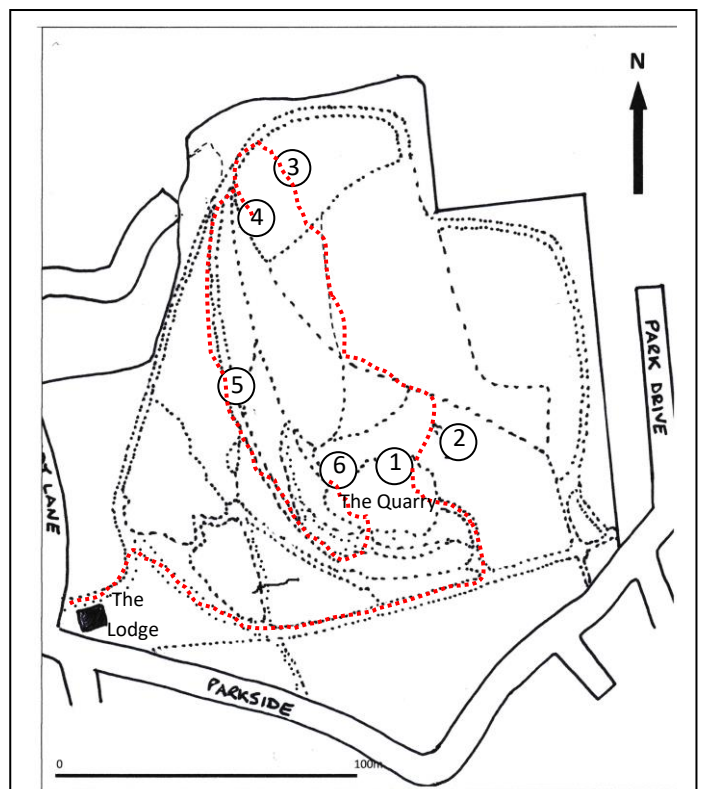
3. **Shallow workings.** These expose coarse grained, feldspathic sandstones which are poorly sorted, angular and show various styles of cross-bedding.

This is the **Rough Rock** again and the fact that the workings are only shallow suggests that this is close to its base. The ground between this location and the Quarry is likely to be underlain by the finer grained **Rough Rock Flags**. Fragments of good flagstone can be found in overgrown workings at a lower level on the steep edges to the west of this site. They are possibly **Rough Rock Flags** but as they are not in situ it can't be certain.

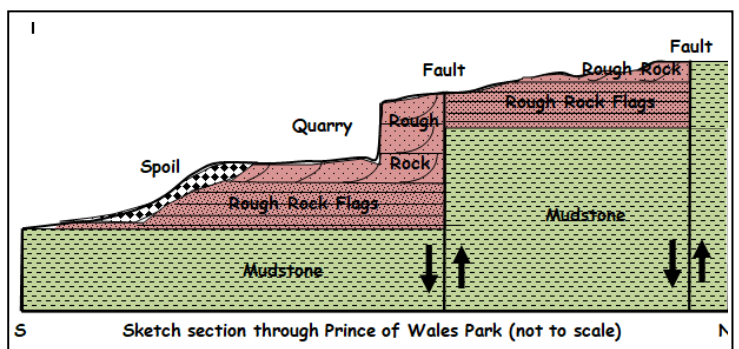
4. **Loose block by path.** This large piece of **Rough Rock** was probably discarded due to the irregular nature of its bedding. As well as cross-bedding it shows several erosion surfaces on the underside of the layers. These were formed when powerful floods scoured away sediment before a new layer being deposited on an irregular surface.

5. **The Promenade.** Many of the rocks along the upslope side of the path contain impressions of plant stems which became preserved when trees were washed down rivers and buried in sand. One type is **Calamites** which gardeners will know today as the weed **Horse Tail** which, in Carboniferous times, grew to heights of 30 m! Another is a giant club moss, **Lepidodendron**. Some specimens may be what are called **Knorria** which are the imprint of the pithy layers of **Lepidodendron**, exposed as the outer bark became stripped away.

6. More plant stem impressions including one almost complete cast of **Calamites**

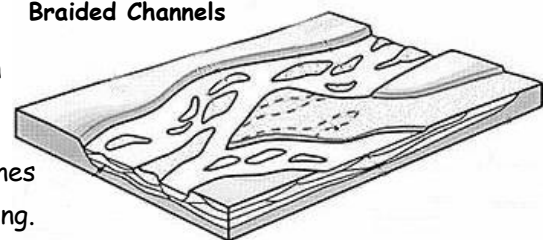


Plan of Prince of Wales Park showing locations



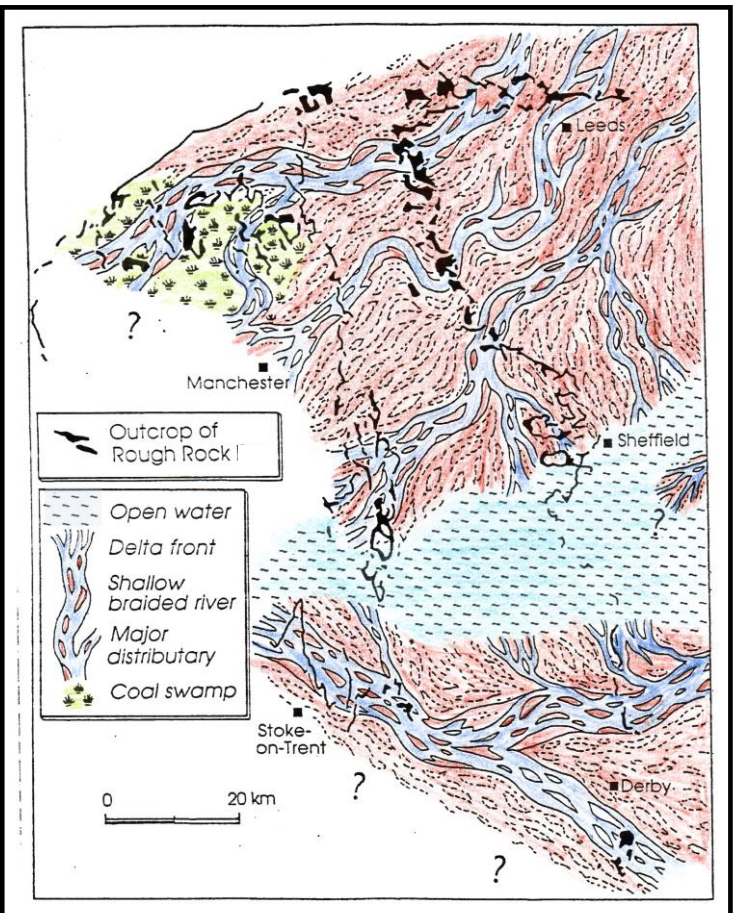
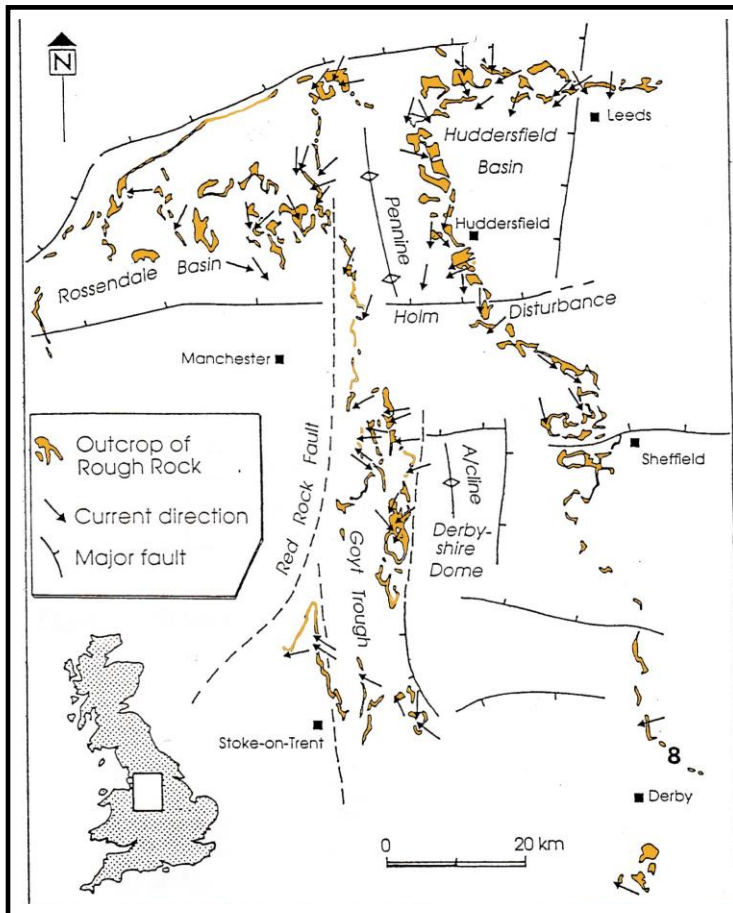
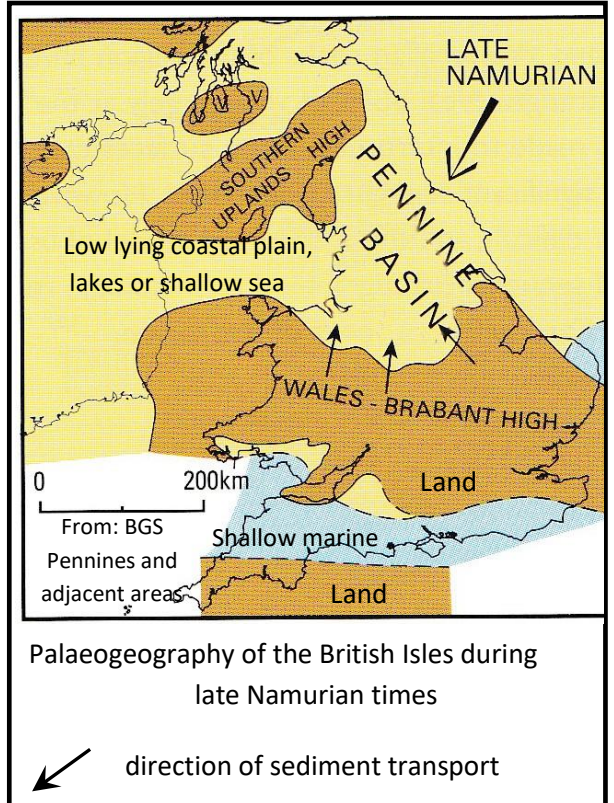
Sketch section through Prince of Wales Park (not to scale)

Braided Channels





Chronostratigraphy				Litho-stratigraphy			
Period	Sub-System	Stage	Substage	Group	Formation	Detail of Rossendale Formation (not to scale)	
Carboniferous	Pennsylvanian	Westphalian		Pennine Coal Group		Rough Rock 12-45 m	
						Rough Rock Flags 0-5 m	
		Namurian	Yeadonian	Millstone Grit Group	Rossendale		
			Marsdenian		Marsden		
			Kinderscoutian		Hebden		
			Alportian		Samlesbury		
	Mississippian	Viséan	Chokerian			Gastrioceras cumbriense	
			Arnsbergian	Silsden			
			Pendleian	Pendleton			
			Brigantian	Yoredale Group			Gastrioceras cancellatum



The Rough Rock forms an extensive sheet sandstone which extends over much of northern England covering approximately 1000 km<sup>2</sup>. It is, on average, 15 m thick but displays local thickness changes reaching up to 60 m in the Rossendale area due to greater intrabasinal subsidence. Its base is usually erosive into the underlying Rough Rock Flags whilst its top (not seen in PoWP) is sharply overlain by shales, coal then mudstone which are the base of the Westphalian, Pennine Coal Measure Group. It is interpreted as being deposited in the braided channels of a large river system sourced from the NNE.