



Exploring the geology and landscape of the northern slopes of the rowley hills

The Rowley Hills

Black Country UNESCO Global Geopark

Further information
To find out more about this site, the geology of the Rowley Hills or other sites and walks in the Black Country Sandwell's Countryside, the following points of contact may be helpful.
Countryside Services, Sandwell Park Farm, Salters Lane, West Bromwich B71 4BG Tel 0121 553 0220/0121 588 6154 www.sandwell.gov.uk If you've enjoyed this leaflet and would like to find out more about rocks and fossils then Dudley Museum at the Archives

The Geological Code
Rock faces, whether in quarries, at the roadside, canal side or in other places, are where we can access this ancient past. Just like sites for wildlife these can be damaged and destroyed by careless actions. So, when visiting a special geological site:
• Obey the countryside code
• Stay on footpaths and never closely approach a high or unstable rockface
• Leaders of visiting parties must plan their visits, seek permissions where necessary, familiarise themselves with the current state of the exposures and carry out any risk assessment that is required by their organisation.

For more information contact the Geopark team based at Dudley Museum & Art Gallery 01384 815575 Please follow this geological code to ensure that our fragile geological sites are protected and used wisely.

Local groups
The Black Country Geological Society meets monthly. The programme includes field visits and interesting talks. For further information - online www.bcgs.info

The Friends of Rowley Hills organise a programme of events and conservation activities through the year. For further information - online www.friendsofrowleyhills.org

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Text by Graham Worton with some quarrying history notes by Alan Cutler. Photographs by, Graham Worton, Alan Cutler, Mike Poulton and Paul Stephenson.

Disclaimer
Neither Sandwell Council, Dudley Council nor any of their employees, nor the Black Country Geological Society, nor the Friends of Rowley Hills, nor the Wildlife Trust for Birmingham & The Black Country accept any responsibility for any loss or injury, howsoever caused, to anyone visiting any of the sites



Quarrying the Rowley Rag and Its Uses

Rowley Rag is a modern abbreviation of the more traditional Ragstone, meaning a ragged sharp angled rock. This partly explains why the Rowley Rag has not been widely used as a building stone owing to the difficulty of 'dressing' but rough blocks have been used in walls locally as can be seen at St Giles Church in the picture below. To the modern geologist Rowley Rag is defined technically as an igneous rock called dolerite or when slightly larger grained, micro gabbro.



Drystone walls were a traditional landscape feature of the Rowley Hills. Some still survive as field boundaries. A hoard of Roman silver coins, mostly dating from the period of Emperor Galba (68-69 AD) was reputedly found hidden in one of these walls in the early 19th century. Rowley Rag was probably first dug on an industrial scale in the late 18th century or early 19th century in building the new turnpike roads.

The dolerite has been extensively quarried on the top and sides of the hills. The quarrying industry began to supply hard building and paving stones (hand-cut cobbles for roads etc) but became a major source of crushed rock aggregate for roadstone and other crushed stone aggregates, in the late 1800s until the early 2000s when quarrying finally ceased. For 200 years the hills provided employment for generations of local people from the surrounding communities.



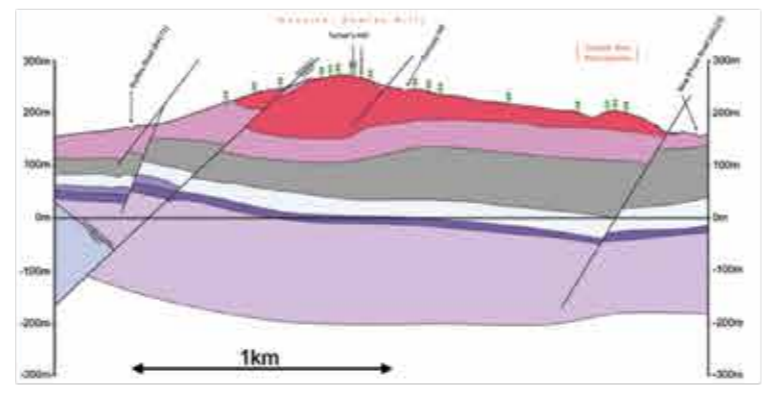
At least 30 separately named quarries have been identified ranging in age from the very recent to some over 200 years old. Today the Rowley Hills embrace areas of public open space, private land, housing, a golf course, a riding stables, grazing land, designated nature conservation sites, relic quarries, spoil heaps and landfill sites. They are among the most important geological sites in the Midlands.

Layers of 'Deep Time' Beneath Your Feet

The Rowley Hills stand high above the surrounding Black Country Coalfield but their origins are part of that wider landscape story. It is a story locked within the rock layers below you. The whole coalfield was formed on a surface of much older rocks that are deep below. These are the limestones and shales of the Silurian Period that we see in places like Wrens Nest National Nature Reserve in Dudley. They date back to about 430 million years.

The layers of rocks that make up the Coalfield are much younger and sit on top of those limestones. They are Carboniferous Period In age and are about 318 to 315 million years old. These are mainly many layers of coal, fireclay, ironstone and sandstone. It was into all these layers of rock that the dark magma that was to become the Rowley Hills was injected at 1200oC about 307 million years ago.

The geological section below is a colour-coded version of what you would see if you could cut a slice down through all these layers and look at it from the side.



As you can see from the section, the ragstone (coloured red) is a very large body of igneous rock that was injected into the landscape here. In fact, it is the largest igneous intrusion of dolerite in the whole of the West Midlands. You can also see from this cross section that it doesn't extend downwards into the deep Earth. Although the Rowley Hills have been almost entirely undermined for coal, no feeder pipe for the molten magma coming up into the rock layers has ever been discovered. Geologists tell us that this is because the magma actually entered sideways, pushing its way in between the rock layers and forcing them apart in a very powerful and violent process that would have caused many big earthquakes at the time that this was happening.

The Rowley Hills Geology Trail (continued)

14. Massey Bank Viewpoint

At the top of the steps is a curved sculptural seat with a metal fire brazier on a raised pole. This is Massey Bank Viewpoint. In 2008 a project called 'Tales of Rowley' happened. 250 local residents chose a winning design reflecting some



of the key industries that had once thrived here - ragstone quarrying and coal mining, nail making (with a figure of a female nail maker) and chain making. The blocks of stone came from the Edwin Richards Quarry on the south side of the hills. The fire brazier reflects the past use of the hills as a warning beacon. Fires on hills were a national communications system lit to immediately spread a warning (literally at the speed of light) of threats such as invasion. These stood ready during times before such things as radio communications had been invented. The sculptural seat made of hand-crafted cobblestones has a flat floor area in front of it inlaid with a compass point set of ceramic tiles dedicated to the first director of Groundwork Black Country. The inlaid tiles act as a toposcope of the view out to the east and north from this point. (Pictures: G Worton)

Follow the track passing between the blocks of ragstone through a metal gate into East Avenue. Follow to its junction with City Road and go straight across into West Avenue. Follow to its end, where it meets a road called Speakers Close and turn right onto a tarmac footpath leading between the houses. At the end of the path the landscape opens out into another large green space.

15. Restored Darby's Hill Quarry

The green space that falls away before you is the infilled and restored surface of what was once one of the largest of the dolerite (ragstone) quarries of the Rowley Hills. It affords a superb view to the north across the high ridge cutting westwards across the Black Country. From this vantage point other Geosites of the Geopark (such as Dudley Castle Hill, Wrens Nest Hill and Sedgley Beacon Hill) are clearly seen rising as an escarpment that faces out to the north across the plain of the Black Country Coalfield.



Illustration of a Rowley Ragstone quarry from Sir Roderick Murchison's book 'The Silurian System' (1839), showing what this quarry may have looked like at that time and below, how the restored quarry looks today.



To return to the start of the walk, turn left and follow the path curving downwards and to the left where you will see that it connects to the end of the road called Viewpoint. Pass through a black gate and continue upwards and along Viewpoint for about 300 yards and you will arrive back to the start point on Darbys Hill Road.

The Iconic Skyline of Rowley Hills

Probably the most iconic and recognisable Black Country skyline is the landscape of the Rowley Hills. The hills are here as a result of the hard weather-resistant rocks that lie below their surface. This walking leaflet is about the special geology of these hills and landscape of the Black Country Coalfield surrounding them.

Geology determines everything. It dictates where the streams and rivers flow, the types of soil, and therefore the plants and animals that are suited to soils and habitats in different places, and even shapes how people use the land. The Rowley Hills landscape and quarrying of 'Ragstone' that occurs here has even influenced where people built their homes and churches. This is a special landscape with the Black Country's highest point (Turners Hill at 271m or 870ft above sea level). It is a recognisable landmark with its telecommunication towers and can be seen from all parts of the Black Country and beyond its boundaries.



The hills connect to the nearby limestone hills of Dudley Castle Hill, Wrens Nest and Sedgley Beacon creating a ridge of land which extends from Sedgley in the north, to Frankley in the south. This ridge splits the Black Country landscape into two different areas. To the north the wide shallow valley of the River Tame draining to the River Trent and the North Sea. To the south the steep steep-sided valley of the River Stour draining to the southwest to join the River Severn and to the Irish Sea.

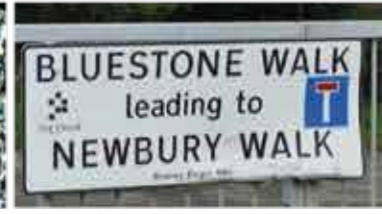
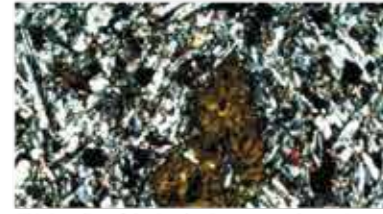
The Rowley Hills and their wider ridge are therefore a significant part of the 'water shed' of central England separating the Severn and Trent drainage basins on either side.



View looking south into the Stour Valley towards Client Hills.

Under the Microscope

To the geologist, the Rowley Rag is actually a type of rock called an olivine dolerite. This is the same in its chemistry as basalt and is the same sort of rock that occurs in famous places such as the Giant's Causeway World Heritage Site in Northern Ireland. These crystals lock together very tightly to create a very hard, dark-grey/green crystalline rock. It was also called 'bluestone' or 'greenstone' by the miners - which you will see on street names around the hills.



This is a slice of the Rowley Rag seen under a microscope showing the interlocking crystals that give the rock its colour and strength and a local street sign referring to the stone

Its individual mineral grains are a mixture of minerals including feldspar and iron and magnesium minerals, such as Olivine (which you may be more familiar with as the semi-precious gemstone 'Peridot' when it is very large) and perfect crystals that occur in other parts of the world. In Rowley however they are not gemstone quality and the value of this stone is in its hardness and excellent properties in hard-wearing uses. This dolerite has been used for kerbstones, gutters and setts. It is still a common street feature in most of the Black Country but particularly in parts of Rowley, Langley and Oldbury. It also famously paved Birmingham streets in the early 19th century. However, it fell into disfavour because with excessive wear it became smooth and polished and dangerous for horses. It has been used widely as aggregate, and dolerite chips were incorporated with concrete to make paving slabs widely used in tarmac road surfacing.

The most unusual use of Rowley Rag though, was in the manufacture of a range of goods by re-melting the rock and casting into moulds. The idea was conceived by Henry Adcock in 1851 who entered into an arrangement with Chance Brothers in their nearby glass-works. A great variety of articles were produced including slabs for steps, window-heads and sills, string courses, mantel-pieces, doorways, copings (like those of The Junction pub in Oldbury pictured), columns and capitals, as well as items for internal decoration such as slabs for tables and sideboards, door plates and knobs. Due to high production costs however, the process was abandoned in 1866



The Rowley Hills Geology Trail

This walking trail is designed for a self-guided circular walk around the summit and northern slopes of the Rowley Hills. It starts with roadside parking at the summit of Darby's Hill Road and takes in 15 points of interest in a walk of 2 miles, which is suitable for all those with reasonable health and mobility. The trail is not suitable for buggies and wheelchairs as it includes rough sloping ground and a flight of steps.

1. Car Parking and Start of the Trail Viewpoint

Parking is available in laybys on either side of Darby's Hill Road.



From here walk up to the summit of Darby's Hill following the fence line of the telecommunications mast (Picture: M Poulton)

2. Darby's Hill Viewpoint

This viewpoint offers magnificent views across the whole of the Black Country.



View looking northwest along the limestone ridge running from Dudley to Sedgley.

Now follow the path downhill to the tree line and round to the left through the trees and around the hill where you will join the wider grassed path that used to be a mineral railway. Follow this back along the edge of the green space (adjacent to the parking) and down until it joins the end of St Andrews Drive.

3. The Site of the Former Lye Cross Colliery

The highest Black Country pit was sited a little way back from the road here. It was called Lye Cross Colliery and the road you've just passed is named after it. This was a famous Black Country pit. In 1878 a large gathering of people of the Dudley and Midland Geological and Scientific Society and Field Club visited. They wrote

that this pit was remarkable as the first sunk through Rowley Ragstone - which proved to be 68 yards thick. Below this was the Coal Measures and at 228 yards the famous 'Thick Coal' was discovered. The pit was taken to a maximum depth of 258½ yards.



From here follow the Portway Road downhill until you come to a public footpath sign pointing to the left into the green area.

4. Public Footpath Turning

At this point you can see how the hard Ragstone beneath your feet makes a dramatic impact on the shape of the land. It resisted millions of years of weathering creating the high hill and causes the very steep slope of the road further along as it meets the softer clays in the valley below you.



From here follow the public footpath to the left until you come to a gap in hedgerow trees. Here on either side there are the half-hidden remains of old Rowley Rag drystone walls.



5. Dry Stone Walls at Good King Henry Corner

Dry Stone walls like these here have been used to mark field boundaries for centuries. These ones probably relate to a time when this part of the hills was being actively farmed. The blocks of Rowley

Ragstone may have been purchased from local quarries or they may have been simply pulled out of the fields during ploughing and then piled at the edges of the fields and eventually laid as walling.



6. The Old Coaching Road to Rowley Church



This clearly was once a tree-lined avenue - an old coaching road between fields here. When you trace it on a map it's clear that it used to lead across the hillside towards St Giles Church about half a mile further around the hill from this point.

Picture looking north along the tree-lined avenue of the old coaching road.

Continue downhill along the main path until reaching a crossroads of paths. Turn right at this junction of footpaths and head downwards to the next footpath post.

7. The Quarried Hillside

Look across the slopes of the hillside here. You can see that they are not gently rolling farmland (as it once was) but is now clearly a quite disturbed landscape. The reason for this is that this hillside was almost completely removed by quarrying of Rowley Ragstone during the last 300 years...and the holes have then been filled in a little unevenly.



8. Quarry Edge & Screening Mound

Here the level of the land changes very rapidly. The footpath here is on top of a long slim raised bank that is low on the left sloping gently into the green site (area of infilled quarry) and very steep and high on the right (where it falls away to the houses below). This is the outer edge of the old quarries and the mound you are standing on was a bank of earth raised around the deep quarry to screen off the workings from view of the houses (and to keep noise and dust

within the quarry workings as much as possible). The quarries were between 60 and 100 feet deep here.



13. Brummichum View

This is another restored and landscaped old quarry that is now part of Bury Hill Park. Follow the path until you reach a level area at the end of the football pitches where the land steeply drops away into the old quarries and reveals a view looking towards the City of Birmingham on the skyline in front of you. You are looking across the eastern part of the Black Country Coalfield and out to the platform of younger rocks on which the modern city centre of Birmingham or 'Brummichum' as local folks refer to it, stands.



Now retrace your steps alongside the football pitch to the public footpath marker at the crossing of paths. Turn right towards Tower Road that is about 50 yards ahead (where St Brades Close joins Tower Road). Head uphill on Tower Road and turn right into Walker Avenue. Follow this road to its end where the car turning-circle is and continue upwards through the trees until it meets a tarmac path. Turn right and there is a green painted bike gate about 50 yards ahead. Immediately beyond this turn left through another green gate and ascend the steep flight of wooden steps to the top of Massey Bank.

TURN OVER TO CONTINUE TRAIL...

Now continue down the track keeping the green fields on your left-hand side until it meets a path on the left. Take the left turn and cross over to the rockface

9. The Portway Site Meadows

The meadows you walk across to the rockface are owned and managed by the Wildlife Trust for Birmingham and the Black Country. Work is underway to reduce the bramble and hawthorn to allow more wildflowers and animals to thrive here.



In terms of inland habitats, bare rock and soil is very rare indeed in inland areas like the Black Country and across the UK as a whole. This rock exposure offers a particularly important habitat to a range of pollinating insects such as mining bees, Marbled White butterflies, and the day-flying Chimney Sweeper moth.

The disturbed soils in front of it are also nutrient poor and these give rise to a wide range of plant species of importance to insects, including Bee Orchids that can be seen here during the summer months.



You will notice that there is a small stone pillar or cairn and a semi-circular low wall seat on the slope a little below the rockface. This was put in as a project under the auspices of the Birmingham and Black Country Wildlife Trust who own this rockface and a large meadow area in front of it. This is a special site for wildlife as well as outstanding geology

10. The Portway Site - Rockface of the Former Blue Rock Quarry

The rockface here is an international Geosite of the Black Country UNESCO Global Geopark. These Geosites are exceptional unique examples of the local natural and cultural heritage that together tell us the full story of the Black Country landscape.

The rockface is all that now remains visible of the uppermost edge of the Blue Rock and Samson quarries, and you are standing on quarry infill that settled to this level after the quarry was backfilled. The rockface has many features that tell us a lot about the way in which the Rowley Hills were formed over the last 307 million years.

The rocks that you can see here are orange/brown in colour and quite broken and crumbly. This is because they were at the surface of the hill for thousands of years and are deeply affected by weathering, by wind, rain, and ice, which 'rots' them away over time to produce a rich soil that you can see at the very top of the rockface here. At deeper levels the good, unweathered



'bluestone' (Rowley Rag) was found and quarried away.

The rocks in front of you were once injected deep underground into the local landscape as a red-hot molten magma at about 1200°C. Under pressure they squeezed sideways into the earlier rock layers and produced a thick mass here in the Rowley Hills.

This hot magma cooled while still deep underground and never quite made it to the surface to produce a volcano here, and because of this crystals formed and locked together to form the hard, dark Rowley Ragstone - without this there would have been no Rowley Hills or quarrying industry at all!



Slowly, deep underground the magma became solid rock. As it cooled further it began to shrink. That caused it to fracture. Cooling was quite even and so is the fracturing caused by it. Fractures are long straight and often parallel creating long stripes (actually columns in 3 dimensions).

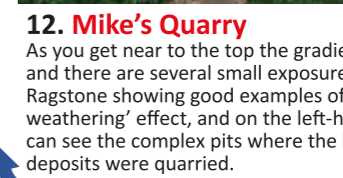
Occasionally horizontal fractures cut across the columns breaking them into smaller box-like pieces, and where water (and steam at the time they were formed) got into these intersecting cracks it eroded the edges, layer by layer, forming flaky rounded balls known as 'Giant's Eyes' at the Giant's Causeway.



11. Bob's Canyon

This steep upward quarryman's path was recently re-discovered and re-opened by volunteers of the Friends of Rowley Hills during a conservation working party. Now locally referred to as 'Bob's Canyon' it leads into a labyrinth of small quarry excavations.

Follow the path upwards until the landscape opens out into a series of old narrow quarries



Continue up the path until it meets another path. Turn right here and you will see a wooden public footpath marker post pointing into the grassland to the right



12. Mike's Quarry

As you get near to the top the gradient levels out and there are several small exposures of the Ragstone showing good examples of the 'onion weathering' effect, and on the left-hand side you can see the complex pits where the best stone deposits were quarried.