

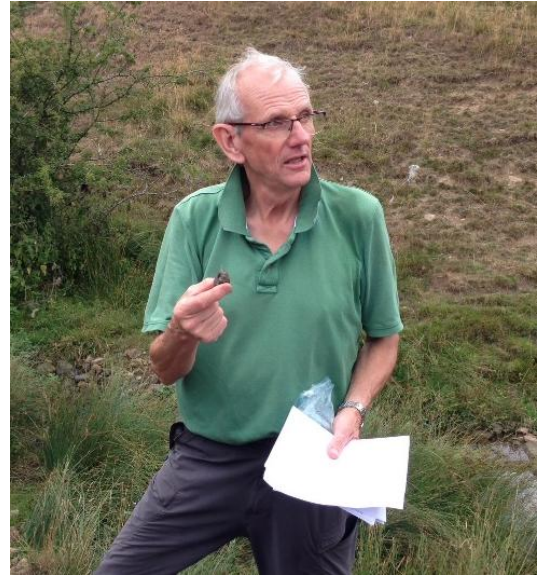
Addingham Geology Trail

5.5 Miles / 9.0 KM

Jill Varley introduces the Will Varley geology trail

“I am honoured to be invited to introduce Will’s Geology Trail for Addingham. Will had a lifelong passion for landscape, geography and geology and was able to communicate his enthusiasm in many ways throughout his career as a geography teacher and adviser in the Bradford area.

After his retirement he was able to devote more time to his interest in the local landscape: teaching classes in Addingham and Ilkley and working on landscape and mining surveys for the Upper Wharfedale Heritage Group. He was in the process of preparing this Trail when his life was ended prematurely by illness in 2021.



Thanks to the help and support of good friends Martin and Judith Ellis the Trail has been completed and stands as a testament to Will’s extensive knowledge of the Addingham District. I have great pleasure in commending it to the village”

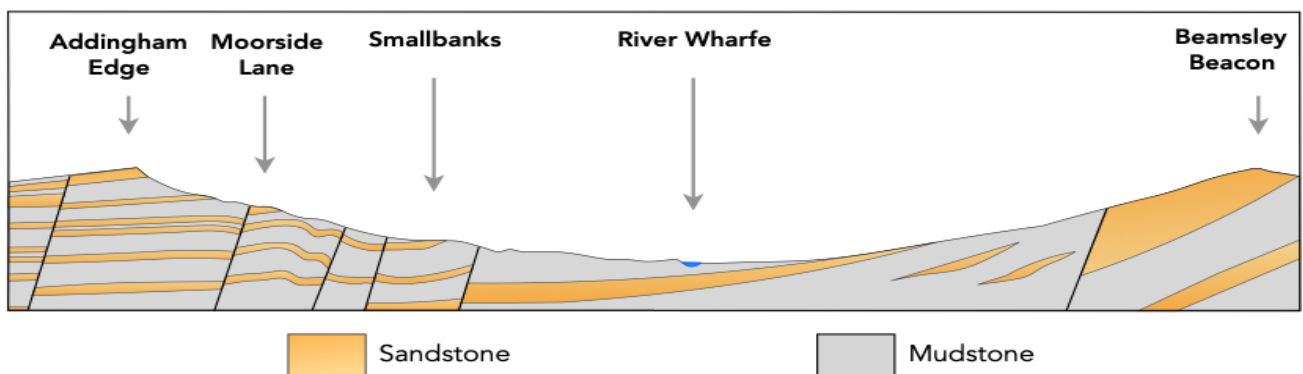
The trail

This walking trail is designed to help you understand the geology of the Addingham district and appreciate its importance in determining the nature of the landscape we see today. The route described is approximately 5.5 miles and ascends from 115 metres to 381 metres. The 1:25,000 scale map OS explorer 297, or similar digital mapping, should be carried in addition to this leaflet. *(If viewing this PDF digitally, tap a numbered point to bring up the location on Google Maps)*

Rocks and landscape

The rocks that make up the landscape of Addingham and the Wharfe Valley were formed during the **Carboniferous Period** 315 to 310 million years ago. At that time most of the area that is now Britain was a low-lying plain with a **rainy**,

tropical climate. Far to the north there was a huge range of mountains. The mountains of Scotland, Scandinavia and Eastern Greenland are the remnants of this ancient mountain range. Sediments brought down from the northern mountains by mighty rivers were deposited in a **delta** covering much of the north of England and similar to those of the Mississippi and the Ganges today. Wide shallow rivers flooded the area when the rainfall was very high. Surrounding the river channels were low-lying areas with lakes and swamps. Muds deposited in the stiller waters of the lakes and swamps were covered up from time to time by sand brought in by flood waters. Occasionally sea levels rose and the delta was flooded by the sea. This whole group of rocks consisting of layers of **sandstones** and intervening **mudstones** is known as the **Millstone Grit Group**. **The form of the valley reflects the character and arrangement of these rocks.** The sandstones are relatively hard and resistant whereas the mudstones are soft and easily eroded. The rocks dip gently to the south east. The gently sloping **north side of the valley** follows the line of the gradually dipping layers of sandstone beneath Marchup Grit and Nesfield Sandstone. **On the south side of the valley** we see the sandstone layers end on giving the slope a more stepped appearance.



A simplified cross-section of the Wharfe Valley showing the arrangement of sandstones and mudstones.

Gildersber and Smallbanks are built on the ridge of Middleton Grit. Brocka Bank Grit forms the ridge above and the sites of Ghyll House and Upper Gatecroft. Addingham Edge Grit forms the bold scar of the moor edge.

The area also shows the impact of the last glacial stage of the Ice Age, the **Devensian glacial**. **20,000 years ago** ice extended over the higher ground and **glaciers** occupied the Dales' valleys. The erosive action of these glaciers broadened and deepened the valleys. As the ice melted there would have been large quantities of water, carrying lots of debris, flowing over ground that was

still permanently frozen cutting deep narrow valleys as **meltwater channels**. **Periglacial conditions** prevailed with permanently frozen ground called **permafrost**, and temperatures around freezing. As the ice melted extensive deposits of the debris, **glacial till**, were left behind. Most of the ice had gone from the area by about **18,000 years ago**.

This geological trail begins at Addingham Library and continues up the south side of the Wharfe valley to the moor edge and return. Ten figure National Grid References (NGR) are given for each location.

1. 103 Main Street

NGR - SE 07636 49820



103 Main Street
The Lister's House (rebuilt 1799)

The house (now a dental surgery) and attached barn across from the Library was once the home of Thomas Lister (Senior) and his son, Thomas (Junior). Here they ran their tallow and candle business. Thomas (Junior) was also the village postmaster. In the 19th century Addingham was a centre of the textile trade and as the industry became increasingly mechanized there was a growing demand for coal for steam engines as well as for domestic use. A

little coal had already been discovered at Gildersber and the two Thomas' together with two other gentlemen formed the "Wharfedale Coal Mining Company" to search for coal in the locality. A pit was begun on Lister's land to the south of the Sailor (now Lord Addingham) Inn.

Walk up the main street to the small car park on the left hand side of the road. Follow the footpath behind the houses on the left (south) side, across the footbridge over the beck and up into the field. The site of Lister's coal pit can be viewed across the field to the west, in the bottom right corner of the field behind the Lord Addingham pub.

2. Coal Pit Site

NGR - SE 07359 49798

In June 1845 the **Addingham Iris** reported that the pit had reached a depth of 17 yards and *“We are glad to state that the efforts to obtain coal in the neighbourhood continue unabated. The spirited proprietors are very sanguine and we most hearty wish them success”*. Despite their optimism the venture came to nought.

The First Edition 6 inch Ordnance Survey map shows a track from behind the Lord Addingham pub leading to a small building and the site of the coal pit. All that now remains of the pit is a shallow depression and a small stone building.



OS First Edition 6" Map 1850



Site of the proposed coal pit

*Continue on the footpath up the left side of the field to a stile by the big oak tree, and into the **hollow lane**. Turn right (west) to another stile. Just before the stile look left to see the medieval field strip of the ancient South Field extending up the field to the bypass.*

Cross the stile and follow the footpath up beside the hedge to the bypass. Cross the bypass carefully. Through the gate, turn left and follow the path left (east) along the line of 'The Street'. The Street follows the course of a Roman road between Ilkley and Ribchester.

3. The Street - Glacial meltwater channel

NGR - SE 07485 49370

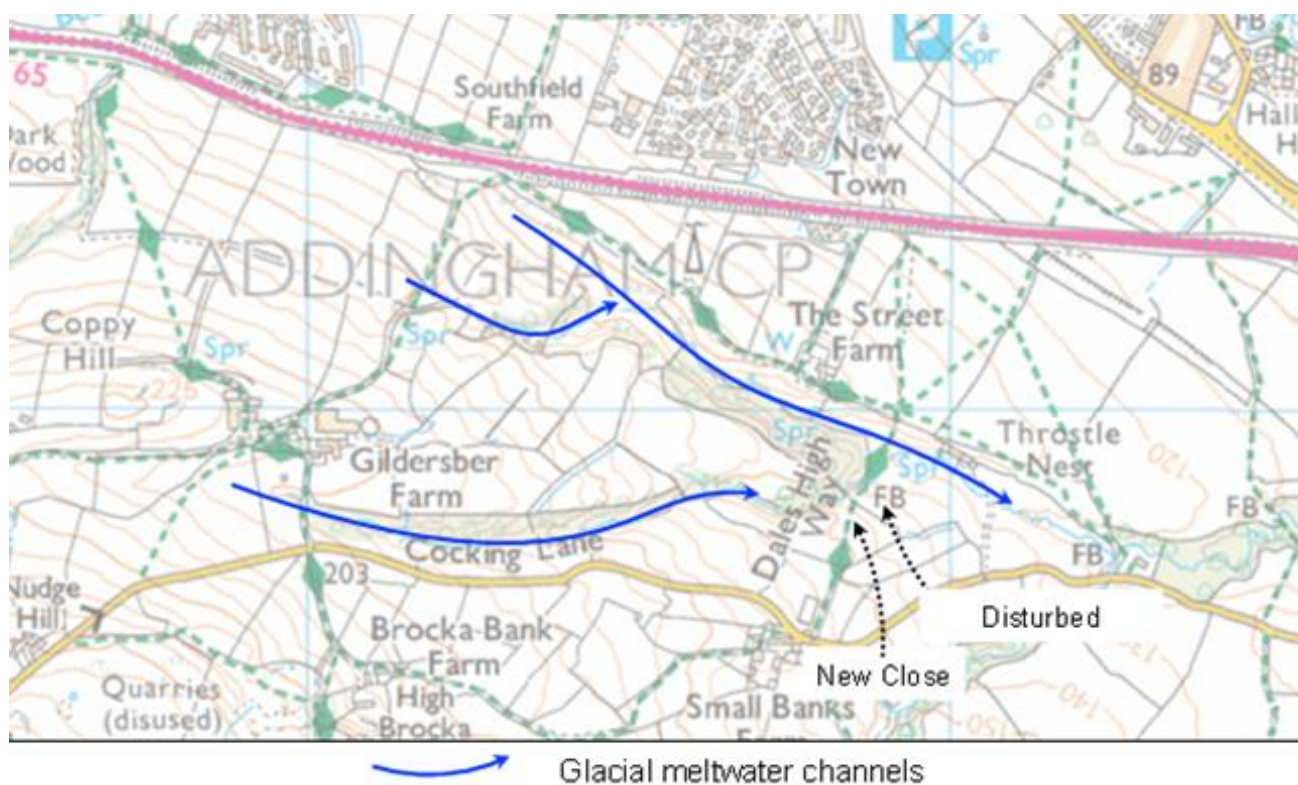


Glacial meltwater channel – looking south east

The deep narrow valley immediately in front of you, and to the south of the line of 'The Street' footpath, was cut by glacial meltwater. The main valley would have been occupied by a glacier and so meltwater flowed from west to east along the edge of the glacier. Today the channel seems at odds with the present-day topography as it cuts across rather

than down the slope. A number of similar channels exist in this part of

Wharfedale. The minor road through Nesfield, on the north side of the Wharfe valley, follows the line of a meltwater channel.



Continue east along the foot path with the glacial meltwater channel on your right. Go through a farm gate at Street Farm, bear right round the buildings and through another foot gateway. Continue east then through another foot gate on the right, down the partly paved path known as 'Cat Steps'.

4. Cat Steps and New Close - Medieval Iron Working

NGR - SE 07836 48819

Mudstones can be seen in the small stream which flows beneath the Cat Steps footbridge (SE 07865 48894), particularly on the right-hand side. Mudstone outcrops are usually found where there is active erosion as here in the stream; otherwise they quickly become stable and vegetated.



Cat Steps - mudstones in the stream

Medieval ironworking sites are dotted across Wharfedale, and fragments of iron slag may be found in many of the small streams draining the sides of the valley. The iron ore consists of nodules of the iron mineral siderite, iron carbonate (FeCO_3), found within the layers of mudstone. The nodules formed as the sediment was buried and lithified (turned into rock). This iron ore was dug from shallow diggings or from small bell pits where a shaft was dug down to the iron ore and then the excavation was extended forming a bell-shaped hollow. The roof was largely unsupported and so as the pit reached dangerous proportions it was abandoned and a new



Cat Steps – siderite nodule

pit dug. The ore was then taken to a **bloomery**, a small charcoal-fired furnace where the ore was heated and hammered to remove the unwanted slag. The wrought iron produced was relatively impure.

Disturbed ground, the remains of shallow diggings, may be seen on the slope on the left of the Cat Steps footpath. At the top of the steps the field beyond the squeeze stile, New Close, contained a number of bell pits which left shallow hollows and in the summer could be further distinguished by their distinctive flora. Some years ago the depressions were filled in and the pasture 'improved' and so identification is now more difficult.



Cat Steps footpath

Continue across the field, through a gate and on to the hamlet of Small Banks. Bear left across the road and follow the footpath sign, through two gates and across the field to a stone bridge over the beck. Turn right and walk up into the field called "Stegholes"

5. Stegholes - Post Glacial Slumping

NGR - SE 07763 48350

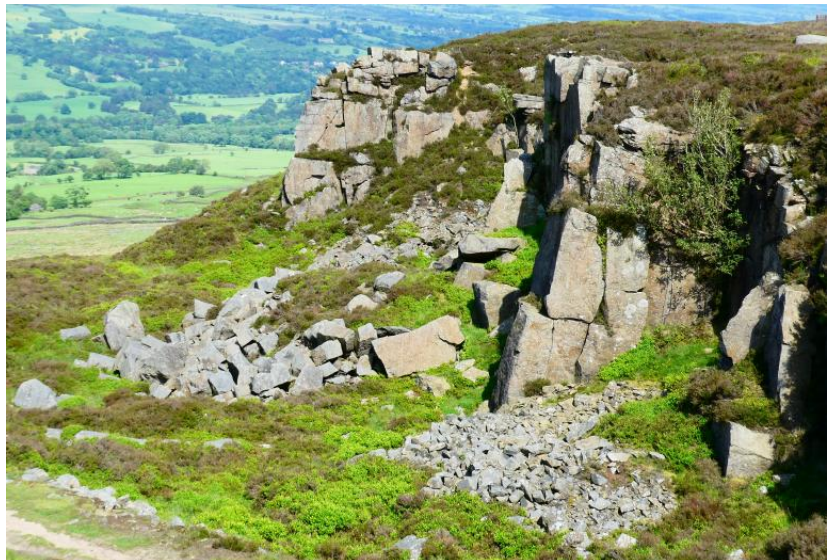
During the glacial periods of the last ice age the ground became permanently frozen as a layer of 'permafrost'. As temperatures rose at the end of the last glacial period the permafrost began to thaw. Heavy with water, the ground slumped and slid downslope exposing more permafrost beneath and increasing the rate of further thawing. The slumping and sliding of the surface layers resulted in the uneven, hummocky terrain. This field is also an important haven for wild flowers.

The footpath now continues up the hillside to Moorside Road. Cross the road and follow the footpath sign straight on up the hill. In the third field above the road a large millstone can be seen over the wall to the left (east) of the path just before the gate into the old quarry workings. Here the path up to the quarry is rough as it crosses the debris from the quarrying operations.

6. Millstone Lumps and Millstone Quarry

NGR - SE 07203 47146

Addingham millstone quarry, known as Millstone Lumps, was a very early quarry on the moor edge. Here the appropriately named Addingham Edge Grit, a coarse sandstone, was quarried for millstones both for local demand and from the East Riding where suitable stone was unavailable. The quarrying may have started as early as 1618 and quarrying continued until the end of the eighteenth century. The quarry was



The millstone quarry

owned by the Vavasours, the Lords of the Manor, but the tenants paid their rent to the freeholders of the village for the relief of the poor. In the 1680s John Wainman paid an annual rent of £6 per annum for which he was allowed to get 16 pairs of millstones per year, but had to pay 6s 8d for every additional pair. In the late 18th century the quarry was the subject of a legal dispute when Richard Smith, the then Lord of the Manor, had to reassert his ownership of the quarry. Kate Mason suggests that during the working period from 1650 to 1800, producing between 32 and 36 millstones each year, the quarry must have produced between 4,800 and 5,400 millstones in total.



One of the many scattered millstones beneath Millstone Lumps



Incomplete millstone attached to bed rock in a small delf hole

On the steep slope and in the fields below the quarry are the remains of over 40 damaged or incomplete millstones. The millstones vary in size and the remains, including one still attached to bed rock, give some indication as to how they were made. The attached stone can be seen in a small **delf hole** just before the path rises through a narrow cleft up to the top of the moor edge on the right about 25 metres from the path.

Plant fossils are not uncommon in the sandstones. Trees grew along the sides of the rivers that carried huge quantities of sediment. '*Calamites*' is the fossil stem of a 'horsetail'-like plant. It has a distinctive vertical ribbed pattern. After burial, probably by the banks of a river or the shores of a lake, the plants trunk rotted away and sediment quickly filled the cavity creating a cast of the inner pith cavity we see today.



'Calamites'

Follow the path up out of the quarry to an indicator post enclosed in a well-built cairn. Here there is the option to walk on to see the Doubler Stones or to begin the return to Addingham. To reach the Doubler Stones, walk on straight ahead (south) and cross the wall at the stile. Follow the path south and the Doubler Stones can be seen on the left.

7. Doubler Stones

NGR - SE 07230 46518

The Doubler Stones consist of two prominent rock stacks on the edge of a rocky outcrop. The top layers of these unusual 'mushroom-shaped' rocks are made up of coarse pebbly gritstone which protected the softer more easily eroded sandstones beneath. The stones were formed in the harsh periglacial conditions at the end of the last glacial stage the softer sandstones were more easily weathered by freeze thaw action and by sand-laden winds.



Addingham Doubler Stones

Return to the indicator post, turn left (west) and walk on the moor top path to the seat adjacent to the Memorial Pillar.

8. The view

NGR - SE 06951 47090

Looking north across the valley the slope rises gently to Beamsley Beacon. The gentle slope reflects the underlying beds of sandstone that dip towards us, older than, and disappearing beneath, the rocks on which we stand. Invisible from here but viewed from the A59 the north side of Beamsley Beacon presents a rocky scarp where we see the sandstone beds end on.

Looking left from Beamsley Beacon is Simon's Seat with its tor-like summit and in the far distance Great Whernside and Buckden Pike. Barden Moor completes the skyline. All these hills are capped with another sandstone, **Grassington Grit**. Again, older than anything in the foreground.

Continue along the moor edge westwards and follow the deeply incised track, Wingate Nick, down to a wall, turn right (east) along the wall to the wall corner ahead. About 60 metres down the slope, is a large boulder.

9. Large Boulder

NGR - SE 06900 47289

This large sandstone block of Addingham Edge Grit has come from the moor edge above. The sand and pebbles that make up this rock have been rolled along river channels by fast flowing water and layers of sediment have been laid one upon another to form this pattern known as cross-bedding.

The block also has many large fossils consisting of the impressions of the bark of *Lepidodendron* trees. These huge trees, also known as Scale trees, were Lycopods or Clubmosses one of the earliest major plant groups. They grew up to 50 meters tall and the bark had a scaly pattern of diamond or kite-shaped scales where long thin leaves were attached.



The boulder with fossils (shoe for scale)

The large number of fossils on this block suggests that a large pile of tree trunks and large branches had been gathered together in a flood event, possibly blocking the river channel.

Return to the path and continue down to the tarmacked Moorside Lane at SE 06743 47800. Turn right along Moorside Lane for 1 km, then turn left to return to Addingham by the outward path.

References

- Arnold Pacey, An Atlas of some Addingham Fields. 2003
- Arnold Pacey, Addingham Houses 1750-1850. 2014
- British Geological Survey, Bradford Sheet 69 1:50,000 Geological Map. 2000
- Kate Mason, Addingham from Brigantes to Bypass. 1966
- West Yorkshire Geology Trust, <https://www.wyorksgeologytrust.org>



