



Wetherby & District U3A
Geology Group

Last updated 3rd Oct 2025

Group name	Geology (aka the “U3A Rockers”)
Approx.group size	25 (prospective new members please contact Ian Harriman by clicking on the link to join the group)
Description	The group studies the rocks and minerals of Yorkshire and neighbouring counties both in the classroom and on practical field trips. We are often led by professional geologists. No prior knowledge is required and the atmosphere is informal and friendly. Please note we are not a walking group: our members are expected to have an interest in geology.
To join this group	Click Here
Group contact	Ian Harriman
Meeting day/time	First Thursday of every month, starting times vary (see programme)
Meeting locations(s)	Clifford Village Hall (unless otherwise stated on programme)
Trips/events?	Approx 7 field trips per year, usually from 09.00 to 16.00 depending on location, sometimes with expert guides. Normally within 1.5 hours drive from Wetherby and around 4 miles walking distance.
Charges/contributions?	All members pay an annual £20 subscription to cover rental of meeting venue, speakers etc. Where cars are shared for field trips, drivers to decide passenger contributions based on mileage.
You will need:	For field trips - weather gear, walking boots, magnifying lens, packed lunch & water. When visiting coastal cliffs, a hard hat is essential. Walking sticks advisable for rocky terrains.
Any limitations?	Some field trips are not suitable for those with physical limitations. Pls check.
Other information	We maintain a large online database of documentation and images from the various meetings and field trips. This is available for regular members to access. A WhatsApp group exists for members.

MEETINGS & FIELD TRIPS PROGRAMME 2026

Details to be finalised at AGM on 5th March 2026. Members receive full details of each meeting in advance by email.

Date	Location & Activity	Leader(s)	Venue/Meeting Point
Jan 8th	Climate change & geology. Talk by Prof Rob Knipe (Univ of Leeds)	Rob Matley	Clifford Village Hall, 09.30 for 10.00
Feb 5th	Minerals in North Pennines. Talk by Brian Young (prev field geologist with BGS)	Rob Matley	Clifford Village Hall, 09.30 for 10.00
Mar 5th	2025 field trips review, AGM, finalising 2026 programme, volunteer roles,ground rules, subs collection	Rob Matley	Clifford Village Hall, 09.30 for 09.45
Apr 2nd	Marsden/Frenchman Bay near South Shields with Michael Mawson, subject to tide.	Catherine	TBC
May 7th	Westgate / Weardale with Brian Young. Catherine seeking confirmation from Brian.Contingency plan is for Ian to bring forward his October field trip?	Catherine	TBC
June 4th	Orton / Shap with Pete Webb	Chris / Allan	TBC
July 9nd	Blanchland Geotrail with Brian Young. Note change of date from 2nd to 9th July.	Allan / Chris	TBC
Aug 6th	Goodmanham, Wolds with Richard Myerscough	Liz & Alan	TBC
Sept 3rd	Knaresborough with Bill Fraser	Lyn	TBC
Oct 1st	Ian TBD. Possible swap with May 7th?	Ian Harriman	TBC
Nov 5th	TBD	Ian Harriman	Clifford Village Hall, 09.30 for 10.00
Dec 3rd	Quiz?	Chrs?	Clifford Village Hall, 09.30 for 10.00

Updated 6th Mar 2026

Note: for field trips, please consult the table above for meeting point and time. If no information is given, please email Ian Harriman (hispor1@gmail.com) for latest information.

Strict field trip safety arrangements apply at all meetings. Please scroll down below.

FIELD TRIP SAFETY

1. The U3A recommends that groups adopt the Ramblers Association risk assessment.
2. Each field trip will be guided by one or more leaders who will be familiar with the route and will point out hazards. Trip members should listen to and follow the tour leader's advice but are ultimately responsible for their own attention to safety.
3. Trip members should provide a contact phone number that could be used in case of emergency (ICE).
4. The Risk Assessment will be posted on the Group's database ("Geology in a Box") for all Group members to read in advance of a field trip.

Please scroll down for the recent Proceedings of the Wetherby U3A Group.

PROCEEDINGS OF THE WETHERBY U3A GEOLOGY GROUP

2023

Lead member and “gentleman geologist” John M’s review of the Group’s 2023 activities.

January

A talk by Bill Fraser on Ice in the Yorkshire Dales

The talk started with an explanation of the Milankovich cycles. How changes in the eccen-tricity of the Earth’s orbit, tilting of the axis of rotation and precession can influence the amount of solar radiation. These effects produce relatively small changes in solar heating in themselves, they are sufficient to generate feedback that exaggerates small temperature differences with decreases in tilt lead to warmer winters (more snow) and cooler summers (less melting). Changes in the planet’s albedo (reflectiveness) of the Earth’s surface. Plate tectonics, land over the poles gives Ice House world, Mountain building (Orogenesis) gives higher (cooler) land and affects air circulation, volcanic activity releases CO_2 (a greenhouse gas) and small dust particles (lowering the air temperature).

Britain has undergone several ice ages interspaced with warmer periods, the first (Lud-hamian) about 2.5 Ma. The most recent being the Devensian ending about 12 ka which covered most of Britain and Northern Europe. At present we are in a warm (interglacial) period (Flandrian). The talk then discussed the effects of the Devensian ice age on the landscape of the Yorkshire Dales. During this ice age the land was covered by ice with only the tops of hills above the ice (Nunataks). The flow of the glaciers was down the present valleys carving these out by erosion, abrasion by rock fragments and ‘plucking’ which led to erratics after glacial melting.

Examples of these features were then shown, polished rock surface and glacial striations in Crummack Dale, the Norber Erratics, slope failure from over-steeped hillsides in the Yoredale group on Whernside, ground moraine on Ingleborough, terminal moraine at Thornton Force, recessional moraine forming Semerwater. The glaciation of Wharfedale at about 16,000 BCE showed a glacier flowing down the valley with a link to the Airedale glacier. On Ilkley Moor the Lanshaw Delves hold limestone brought down from upper Wharfedale (visited on a previous field trip). Drumlin fields at Ribblehead and an Esker near Bainbridge are other glacial features illustrated, as well as the meltwater valleys at Trow Gill and Goredale Scar.

February

A talk given by Bill Fitches on the African Rift Valley in Kenya based on his considerable experience working there for many years. The Rift Valley is ‘unzipping’ Africa, a construc-tive plate boundary separating at about 5cm per year, though slower further south. The Kenya dome is a mantle hot spot (Precambrian) with volcanoes and geothermal activity, yet to be fully exploited commercially. The Rift Valley is the precursor to sedimentary basins. Algae forms in the lakes, become lacustrine sediments and in the hot, dry atmo-sphere form hydrocarbons. These have now been commercially exploited.

The continental extension caused by plate separation shows both normal faults and Horst-Graben faulting giving a tilting of blocks. This feature was clearly visible in the slides shown in the talk. In the Syn Rift there are in the lakes deposits of diatoms, unicellular plankton with siliceous cell walls contributing to the sediment. The drainage is away from the Rift, giving in the hot dry climate deposits of Magnesium, sodium and Potassium salts.

There is strong evidence of human activity (stone tools) going back at least 7500 years.

March

This was a planning meeting when we discussed and arranged field trips for the coming year. Several possibilities were presented from which we made our choice. Our accounts were approved and the costs involved fully explained. We welcomed a new member and enjoyed conversations afterwards.

April

Thixendale, Yorkshire Wolds

This was our first field trip of the year to look at the distinctive Wolds scenery, characterised by narrow, steep-sided dry valleys within a relatively flat landscape. The Wolds were formed as marine limestone deposits during the Cretacious period about 100Ma. At the end of the Cretaceous there was a major fall in relative sea level and chalk deposition stopped.

At the beginning of the Cenozoic 65Ma the western part of Britain was uplifted by basaltic magma rising to form the new oceanic crust of the North Atlantic. The crust of the North Sea Basin continued to stretch and sink and Britain suffered a general eastward tilt. After the ice age glacial till (boulder clay) filled the gaps between the layered chalk. This boulder clay eroded much faster than the chalk, leaving leaving large chalk hills and narrow valleys, the Wolds.

Our walk was led by Richard Myerscough and began in Thixendale village ascending to the plateau, stopping on the way to examine the chalk fragments in the boulder clay by the side of the track. We examined chalk which had been hardened through the action of water (fluidization). We then descended into Water Dale climbing a mound caused by a land slip. From there we climbed again onto the plateau, following the Yorkshire Centenary Way, and to descend into Vessey Pasture Dale. We had a slight detour to look at a ploughed field covered in broken up chalk and containing many pieces of flint. Many of these had been worked in prehistoric times and we found several of these. The outcrops of chalk we saw on our walk contained quantities of flint. Passing through The Warrens we came to Honey Dale where we saw a doline. This appeared as a small indentation in a ploughed field but had been excavated fully in the past to reveal its structure. We then descended the steep slope into Court Dale and the top end of Water Dale before heading back to the village for tea/coffee and cake at the Village Hall.

May

Our field trip was following the Roundhay Park Geology Trail led by Bill Fraser. Our first stop

was at the castle (folly) where we noted that the lower of the walls were made of rounded boulders of sandstone. These were carried here by an ice sheet that spread across Britain about 300,000 years ago. We then walked down the gorge stopping first at a shale bank. Shale forms only in a low energy environment (very calm water). The fossils found in the shale are mainly non-marine in origin, though a few marine fossils are seen indicating that the lagoon may have been occasionally flooded.

We walked a small distance to see some obvious folding on the opposite bank created by powerful earth movements after the rocks had been formed. Further down the stream we saw that a thin sandstone bed within the shale caused a small waterfall. Downstream we came across ‘Dog Mouth Spring’. Here a layer of sandstone is overlying a Rough Rock (coarse gritstone) As sandstone is much more pervious that the rough rock, the water col-lected within the sandstone leaves the rock at this point. We then left the main path to visit a small quarry where we observed some cross bedding, the gently sloping line in the rock were one the faces of dunes. Also in the quarry was a small fault, the rock layers being moved about 50cm. Walking back to the main path we passed a large gritstone boulder containing quartz pebbles.

The gorge opens up at Waterloo Lake to form a wide, shallow valley. The rocks underlying the lake are sandstones of the coal measures. These are harder than the shale in the gorge so there has been no erosion by the stream. This sudden change in rock type indicated a major fault moving the rocks south of the fault down by 150m. The Roundhay Park Fault (RPF) marks the northern boundary of the Yorkshire Coalfield. The final stop was at a sandstone belonging to the Elland Flags. These are on the downthrow of the RPF showing ripples formed by wave action and marks left by burrowing worms.





Figure 1: Thixendale: (a) rock and flint in the boulder clay, (b) hardened chalk.



Figure 2: Thixendale: (a) descending into Water Dale, (b) chalk and flint fragments in a ploughed field.



Figure 3: Thixendale: (a) Court Dale, (b) back to the village.



Figure 5: Roundhay Park: the folly and folding.



Figure 6: Roundhay Park: Waterfall and Dog Mouth Spring.





Figure 7: Roundhay Park: Gritstone boulder and an example of rough rock.

Visit to Ecton Hill Copper Mine, Staffordshire. 3 August 2023.

This visit was one of the furthest that the group had undertaken but its exceptional

qualities attracted the interest of over a dozen members.

The Ecton Hill mines are found in the Manifold Valley, near Hartington, just over the Staffordshire border with Derbyshire. They are some of the most famous copper mines in the country, and have been worked right back to Bronze Age times for conversion to Bronze itself, which is an alloy containing about 90% copper and 10% tin. The mines are somewhat different from most lead mines in the Yorkshire Dales for example, where the mineral occurs in 'horizontal' veins. In this case, the mineral is found as a 'pipe vein', that is in a vertical vein, which stretches from the surface down to a depth of about 1350 feet below the surface.

We commenced the day by looking at the extremely folded, sedimentary rock at Apes Tor. It was the pressure and heat from this folding, caused by the formation of the supercontinent Pangea, that resulted in the deposition of minerals such as copper.

We looked at the different technologies used to mine the minerals from horse and water power, to the very first steam engines. The technologies only highlighted the amount of heavy labour and brutal conditions the miners and their families must have experienced.





The Duke of Devonshire owned the copper and sold it on to the shipbuilding industry for and helped fund Chatsworth House and gardens. He used the proceeds to pay off gaming debts

The mine buildings include a geological museum where rocks could be examined, some of which were seen to fluoresce under UV light.

The culmination of the visit was a tour of some of the mine shafts with the aid of miners helmets and lamps. These corridors extend hundreds of metres through solid limestone and were mostly cut by hammer and chisel. We walked, stooped, through these galleries with the rock layers and mineral deposits being pointed out by the tour guides.
In all a fascinating journey through geology, industrial archeology and human history.





2022

Lead member and “gentleman geologist” John M’s review of the Group’s 2022 activities.

We started the year with a guided tour of the Leeds Discovery Centre. This is a large store of items not displayed in the Leeds Museums as well as a dedicated research facility. Also engaged in conservation work. We were most interested in the large collection of rocks and minerals.

This was followed by a talk by Bill Fraser on Trollers Gill in preparation for a field trip later in the year. His talk included the formation of the Carboniferous limestone beds, the subsequent faulting and the extraction of minerals (lead/galena and feldspar) from mineral veins. Trollers Gill lies just to the south of the North Craven Fault (NCF). The Carbonifereous sequence (Dinantian and Namurian 365 – 313 Ma) is in the Craven Basin being thicker than north of the NCF and folded during the Varsican orogeny (late Carboniferous/early Permian).

The main purpose of the meeting in March was to discuss future field trips and to welcome new members. The meeting finished with short presentations on the Greenhow mine visit and the decline of Geology as an academic subject.



Figure 1a: Trollers Gill: Gill Heads mine,

In April we had our field Trip to Trollers Gill. At the car park we got a general view of the location, looking north to marshy land lying on Bowland Shale and the gritstone outcrop of Fancarl Crag, looking south to typical limestone scenery. Here we are on the northern limb of the Skyreholme anticline and in the distance is the Grassington Grit of Simons Seat on the southern end of the anticline. We followed the miners track to a cutting. Here we saw two different types of limestone on opposite sides of the cutting showing different types of fossils. We walked down to Gill Heads mine where the Gill Heads vein can clearly be seen cutting vertically through Asabian limestone.



Figure 1b: Trollers Gill: Entrance to Jackdaw Nick.

Further down is a sudden change in the valley floor near where it joins the main Trollers Gill valley with the valley slopes littered with gritstone erratics. This was interpreted as being the end of a moraine from when the area was covered by an ice sheet during the Devensian ice age. Our aim was to walk through Jackdaw Nick but this was impassible as the stream was in full flow and we could only view its southern end. What caused Jackdaw Nick to form is not fully clear. The original idea was that it is a collapsed cave and some overhanging rocks at the start give some credence to this. However, there is a relatively small amount of debris in the Nick to counter this idea and an alternative interpretation is that it was cut by sub-glacial meltwater and the debris is from rocks falling from the walls. On the walk back to the car park we climbed to a prominent position which gave a clear view of veins, the sinkholes and the topography of the Skyreholme anticline.



Figure 2a Hull Pot

Our next trip was to Hunt Pot and Hull Pot. We started at Horton-in-Ribblesdale and followed a green lane to Hull Pot. Following the green lane we got very good views of Pen-y-ghent towering over the surrounding moorland. Here we saw the typical step profile of the Yoredale sequence, repeated layers of limestone, shale and sandstone. Hull Pot is a large 20m deep hole, 60m long and 15m wide with a stream entering about half way up one side. A pleasant feature was blackthorn and primroses being in full flower.



Figure 2b. Hunt Pot

Above the pothole was a dry stream bed where we found fossils, particularly the Girvanella band, a marker for the change between two limestone formations. We followed the dry valley from the pothole to a watersinks where a stream goes underground. We noted that the dry

stream bed was full of rocks, mostly sandstone, brought down when the stream is in flood which continues further down the valley to the pothole. We returned to the main path noting the change in the type of vegetation, indicating a change from limestone to shale as the underlying rock. We then climbed a short distance to Hunt Pot, about 60m deep with further potholes descending from it. This is formed from a joint in the limestone becoming enlarged by water erosion.

Our next field trip was to Bolton Abbey. From the village we walked down to the foot- bridge where we observed a 20m outcrop of Bowland shale. This has thin layers of muddy limestone. Slightly downstream is an outcrop of Skipton Moor Grit indicating the existence of a fault between these two outcrops. We then walked about 100m upstream where we could clearly see several examples of disharmonic folding on the other side of the river. These were formed within the Skipton anticline during the Varsican Orogeny 370-290Ma ago when the bedding-plane slip concentrated movement in the relatively soft shale lying between harder beds of limestone and grit. We then crossed the meander to observe further examples of folding and from here river terracing was was clearly seen.

After crossing the river and a brief stop at the Cavendish cafe, we walked through the woods to the sulphur well. This had dried up because of recent lack of rainfall but normally white filaments can be seen produced by sulphate-reducing bacteria in the sulphate in the groundwater from the pyrite, FeS_2 in the shale. Following the path upstream we passed through an area of gritstone boulders marking the position of a small fault striking northeast–southwest. We then continued to the Strid where the width of the river changes dramatically. Here the Wharfe descends through large pot holes which originally developed along a narrow joint in the river beds. As the water level was low, some of these could be seen at the side of the river. We also noticed a change in the nature of the gritstone to a coarser, pebbled form. The bedding planes in the gritstone were also visible. We finished with a pleasant walk through Strid Wood to the car park.

In August We visited the red sandstones of the Eden Valley, one in Appleby and the other near Brough Sowerby. The aim was to compare these sites, to note the similarities and differences, and to try to determine the geology of their formation. The Appleby site was largely a quarry face though part of the original exposure could be examined. Our observations were that the sand grains were small, of similar size and mostly well-rounded. We saw some obvious layering in the unquarried part and, in the quarried part, cross bedding. One feature that we could not fully interpret were lines of different colour (yellow) that stood out from the red sandstone. Our conclusion, on noting that Britain lay land-locked in Pangea just north of the equator in a hot arid zone, that this formation was sand dunes blown by the wind.



Figure 3a: Appleby site: evidence of cross bedding

The second site at Brough Sowerby was similar in some respects to the first one in that it was composed of red sandstone. However, there were several important differences. The sandstone contained lots of well-rounded pebbles much larger in size than the basic sand matrix. There were also what looked like fossils/remains of vegetation roots. We did not see any evidence of cross bedding though layered beds were seen. The most striking difference between the sites was a bed, up to 1m in thickness, of Brockram (Permo-Triassic Breccia of N. England) lying above the sandstone. This consisted of badly-sorted pebbles of varying sizes from quite small to large, of at least 15cm. Our conclusion, noting that Britain at this time was south of a large mountain range, was that water flows played a significant role in this formation with the Brockram resulting from a flash flood.



Figure 3b: Appleby site: evidence of cross bedding



Figure 3c: Eden valley field trip: the group.

In September we went to Speeton (Filey Bay) The main aim of this field trip was to walk south along the beach from the car park at Speeton to examine the changing structure of the cliffs through three geological periods (Jurassic, Cretaceous, Quaternary). The cliffs are composed mainly of glacial till resulting from the merging two glaciers, one starting in the Lake District, Vale of Eden, crossing the Stainmore Gap and Lower Teesdale, the other starting in Eastern Scotland and Northumberland and Durham. This till contained many erratics seen clearly in the rocks deposited at their base by coastal erosion. We identified gneiss (from Northern Scotland or even Norway), red sandstone (Eden Valley), chalk (possibly from the Wolds), Carboniferous limestone (Dales), Sandstone (Durham) and red and white chalk (white chalk coloured by ferric oxide) more locally from Buckton Cliffs. We also found a variety of fossils.



Figure 4a: Fossils and erratics



Figure 4b: More fossils on the beach

Observing the cliffs as we walked along the beach we passed a Shell Bed (bivalves and gastropods) indicating temperate estuarine conditions plus Jurassic clay (black pyritic shales and paper shales with large dolomite concretions). Ammonites and small molluscs are

preserved. Also, belemnites and brachiopods may be found in the black blue and brown clays.

In October was the National Mining Museum (Caphouse Colliery) After meeting for coffee, we had a guided tour of the colliery buildings. We were shown the Steam Winding House (now electrically operated), the Screening Building (where the coal is sorted and rock re- moved prior to being transported) and the original steam boilers. We then went on our underground tour, having left everything with a battery, including our mobile phones, on the surface and getting a light and a hard hat, both of which we found to be essential. We then descended about 400ft in the cage to the coal face. The tour through the mine tunnels gave us an insight into how mining had changed through time.



Figure 5a: NCM: Our guide to the site

At the start we saw the truly appalling conditions under which the miner, his wife and, often very young children, worked. Later a coal face was exposed by blasting and the coal extracted from relatively thin seams by pick and shovel to complete a stint, about 8 tons. This led on to more modern mining gear which cut its way into a coal seam, extracting very much more coal and left behind roof supports as it advanced into the seam. Coal dust is a major hazard both to the miners and a possible cause of an explosion. To counter this bags of limestone were hung up which would split open in an explosion to dowse any flames. At the end of a shift limestone powder was spread over the workings, giving rise to the phrase ‘done and dusted’.

After ascending to the surface we went on a tour round the rest of the site. We visited the Hope Pit, the original mine workings, seeing the Compressor and Fan Houses. There was also an exposure



Figure 5b. View of the colliery site.

where a thin coal seam could be identified. After this we went to the Miners Memorial Garden and a stables where where four pit ponies were kept. These enjoyed a much more pleasant life than the original pit ponies who spent 50 weeks a year underground. On our return we passed reed beds where the polluted water from the pit is purified before discharge into the local stream.

Our first indoor meeting gave a review of the field trips undertaken this year. These talks by the group leaders provided a full summary of our field trips this year and put them into a more general context of the Geology of Yorkshire. We also welcomed some new members. We finished in December with our annual Xmas geology quiz followed by mulled wine and mince pies.



Figure 6. Xmas Quiz

2021

Lead member and “gentleman geologist” John M’s review of the Group’s 2021 activities.

We continued with our Zoom meetings at the start of the year. We had a presentation on the Geology of Majorca detailing the way the island came to be formed and the effect that the underlying Geology has on the present Agricultural and Tourist Industries. With the hope of the lockdown being lifted, we had two further Zoom meetings preparing us for the field trips to Ilkley Moor and Filey Brigg. After the first lockdown was eased in the Spring, we could then undertake further field trips.

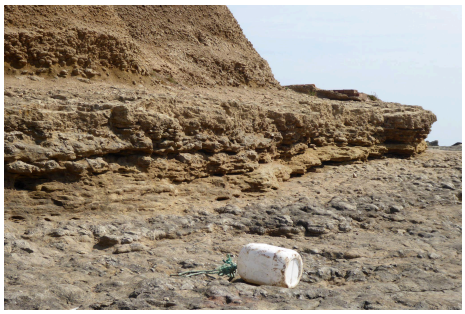


The first was to Ilkley Moor where the main aim was to examine the gritstones formed in the Carboniferous period and the effects of glaciation in the lower Wharfe valley. The types of gritstone and sandstone typical of the area were clearly seen in the Cow and Calf and Hangstone quarries. Faulting was observed at Backstone Beck and glaciation at Lanshaw Delves. Here we found a long moraine composed of limestone brought down the valley by the most recent glacier. An interesting feature of this field trip was the many petroglyphs, ancient rock carving done by our Neolithic ancestors.

Our next field trip was to Millington Pastures in the Yorkshire Wolds to see the chalk laid down in the Cretaceous period. Here the main features are escarpments and narrow, steep-sided valleys. As the chalk layers were uplifted by earth movements, cracks formed which were filled by boulder clay during the Ice Ages. These rapidly eroded after the glaciers had gone leaving the valleys typical of the Wolds. The steep-sided valleys maintain a rich vegetation of many lime-loving plants.



In August the Geology Group undertook a field trip to examine Filey Brigg, a natural peninsular designated as a site of special scientific interest (SSSI). It consists of layers of sandstone and limestone belonging to the Coralline Oolite and Upper Calcareous Grit Formation and is approximately 150 million years old . Overlying are some of the best preserved glacial sediments belonging to the Upper Pleistocene chronologically separated into the Skipsea and Withersea Tills. They were formed between twenty and seventeen thousand years ago and yield a diverse range of uniquely British rocks which has assisted identification of the source of the ice that carried and subsequently deposited the till. Trace fossils of the numerous burrows made by the arthropod Thalassinoides were observed in underlying Jurassic rocks. We then moved to Betton Farm situated approximately 10 miles NW of Filey Brigg where we were able to examine a Jurassic colonial coral reef (Thamnasteria). This formation is approximately 120 million years old and represents localised reef development situated near the base of the Malton Oolite member. It created a lagoon and was colonised by large gastropods and reef specialising burrowing bivalves. Many examples were found including part of a large ammonite. Lunch was provided by the farm restaurant and brought this interesting field trip to a successful conclusion.





Our final field trip was to Greenhow. As we descended to the mines we passed through different rock formations, limestone, grit and shale, observing the marked changes in vegetation, finding



a good number of fossils, mainly crinoids, in the limestone beds. We saw the effect of the North Craven Fault on the landscape. At the mines we searched the spoil heaps, finding nice examples of Galena and Barytes. On the return we passed bell pits, the original way of mining for lead.

In November we returned having meetings inside. Starting with a presentation on interpreting the Yorkshire landscape through the underlying Geology.

The year finished with our Christmas quiz, testing our Geological knowledge (or lack of), finishing with mince pies. In summary, in spite of the many restrictions caused by the Covid virus, we have had a very enjoyable and informative year.

2020

Lead member John M's review of the Geology Group's 2020 activities.

Our planned talks and field trips have all had to be postponed this year. We have relied instead on zoom meetings which have proved very successful given the present restrictions. We started with a talk followed by an active discussion on Planetary Geology, examining how the knowledge of the Earth's geology can help with the interpretation of what is observed on the other planets and moons of our solar system. Our next presentation was Men of Rock. This described how early geologists attempted to understand the formation of the Scottish Highlands which involved very detailed observations often having to endure great hardship to get these results. We have also had links to other web sites enabling us to keep up with our interest. These varied in range from the early volcanic formation of the British Isles to a virtual field trip round Bempton Cliffs and Flamborough Head.

Our year ended on a high note with a quiz, This was enjoyed by all who took part, finding out what we had remembered (or forgotten). It involved a great deal of thought, as can be seen in the screenshot below. The presentations and quiz were very much a team effort starting with getting us to use zoom then preparing talks and the quiz. We are planning to continue with similar in the New Year with the hope we may able to have field trips again next Summer.



FIELD TRIP PHOTO GALLERY

Our spring and summer field trips involve visits to some interesting places, with plenty of opportunity to look for different rocks and minerals, or study their use.















If you're wondering what our field trips are like, read on!

A typical field trip…….

Thixendale, Yorkshire Wolds

This was our first field trip of 2023 to look at the distinctive Wolds scenery, characterised by narrow, steep-sided dry valleys within a relatively flat landscape. The Wolds were formed as marine limestone deposits during the Cretacious period about 100Ma. At the end of the Cretaceous there was a major fall in relative sea level and chalk deposition stopped.

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Another typical field trip….

ROUNDHAY PARK GEOLOGY TRAIL

On a cool sunny morning members of the U3A Geology Group set off on the 3-mile Roundhay Park Geology Trail. The trail has been developed by The Friends of Roundhay Park and The Leeds Geological Association. The trail booklet can be purchased from The Mansion House, currently £1. Each geological feature is marked by a numbered stone showing the trail logo so we had to keep a close eye on the ground as well as on the map. A variety of fossils have been found in the rocks at Roundhay Park. The plants include tree fern and stems of a giant horsetail. The animals include *Goniatites* (extinct animals that are related to squids but look a bit like Ramshorn pond snails), cockles and mussels.



Some of the members of the Wetherby Geology Group at Roundhay Park

The group set off from the Lakeside Café car park heading uphill on the path to the right of The

Mansion House. We turned off to the right passing the Victorian Shelter and the Upper Lake with The Castle being our first stop. Most of us had never been to this part of the park before and one of us had never even been to Roundhay Park at all! At the Castle we viewed the **sandstone** boulders that form the base of the walls. As the trail progressed down a wooded gorge alongside a stream, we saw layers of **sandstone,** layers of **shale** and learned about **synclines** and **anticlines** from our leader and geology expert John Turner. These features generated some interesting discussion. Although we didn't need them, it was gratifying to note the presence of benches for the weary along the path in this steep sided gorge. Further along the gorge we saw a waterfall and then some springs bubbling out of the **sandstone.** The trail then took a detour on an easily negotiated rough, unmade path up the hillside to a stone quarry which provided the stone (**gritstone** called **Rough Rock**) for the park's walls. Some waste blocks of **gritstone** found nearby contained white pebbles of **quartz** which had probably originated in Greenland.

After returning to the main path, the Gorge suddenly widened to form a wide shallow sided valley that had flooded to form Waterloo Lake. The **sandstone** rocks under the lake are approximately 1 million years younger than the shale of the gorge. At the side of the path, the final marker (No. 10) identified benches of rock that are **sandstone** belonging to the **Elland Flags** of the **Coal Measures;** these **sandstones** are the youngest rocks in the park. Ripples formed by wave action and marks left by burrowing worms could be seen on the top surfaces of these rocks. **Elland Flags** are an important building stone and were used to build The Mansion House.

We all thoroughly enjoyed following the Roundhay Park Geology Trail for its geology but also for the discovery of an unknown (to some of us, at least) area of the Park. If you have never been, give it a try.