



Manchester Geological Association

President: Dr Margaret Hartley

June 2023

www.mangeolassoc.org.uk

Founded 1925



An unusual coral fossil found on the beach near Molfre, Angelsey.

Quick Diary

Outdoor Meetings

- Sunday 16th July.** Force Crag Mine, underground visit
Saturday 2nd September (or Sunday 3rd if weather is 'unreasonable') to explore the volcanic rocks above Bonsall Village
Sunday 30th September. Alderley Edge Copper Mines, underground (Engine Vein) and surface

Indoor Meetings

- | | | |
|------------------|--------------------|-----------------------------------|
| Saturday | 14 October. | Broadhurst Memorial - Volcanology |
| Wednesday | 8 November. | Zoom meeting |
| Saturday | 9 December. | Structural Geology |

Who's Who in the MGA

Officers

President: Dr Margaret Hartley

Vice-President: Dr Rufus Brunt

General Secretary: Sue Plumb BSc

Membership Secretary: Steve Daniels

Treasurer: Peter del Strother

Indoor Meetings Secretary: Ken Jacobs

Field Excursions Secretary: Peter del Strother

Newsletter Editor: Lyn Relph BSc

Webmaster: Peter Giles Msc

MGA Archivist:

Other elected members of Council

Prof. Ray Burgess

Nicola Fowler BSc (Hons)

Dr Steve Donovan

Sally Dulieu

The Immediate Past President, Manchester Geological Association: Niall Clarke

RIGS Representative: Dr Chris Arkwright

MGA email addresses

To contact our President: president@mangeolassoc.org.uk

To contact our Vice-President: vicepresident@mangeolassoc.org.uk

To contact our General Secretary: secretary@mangeolassoc.org.uk

For membership enquiries: membership@mangeolassoc.org.uk

For field visit enquiries: outdoors@mangeolassoc.org.uk

For indoor meeting enquiries: lectures@mangeolassoc.org.uk

For newsletter correspondence: newsletter@mangeolassoc.org.uk

For other enquiries: info@mangeolassoc.org.uk

Fred Broadhurst Memorial Field Trip: Lyme Park Part 2: Fossils and Features

Sunday 23 April 2023

Leader: Jane Michael

On a reasonably nice day, 12 members and visitors joined leader, at National Trust Lyme Park for the second of two field trips based on the geology of the Park and Fred Broadhurst's Rocky Rambles in the Peak District (the first one had been in 2021 once Covid restrictions had eased).

Jane outlined the basic geology of the area, Lyme Park is situated at the bottom of the Carboniferous Westphalian (Coal Measures), say 315Ma. It comprises a series of sandstone ridges with shales/mudstones and the occasional coal seam. It is also highly faulted. Approximately 4km (2.5 miles) to the west is the Red Rock Fault which brings the Permian Collyhurst Sandstone and Triassic Manchester Marl down beside the much earlier rocks. The Manchester Marls and the Collyhurst Sandstones are conformable giving an approximate age range 280– 270Ma. Over the last two million years of the Quaternary, during the various glaciations which occurred, the whole area would have been covered and recovered by ice sheets. Generally what we see today reflects the Devensian stage covering the period 115Ka to 10Ka. It is known that there was a late flourish of ice advance known as the Loch Lomond Stadial around 11,000 years ago which resulted in much of the landscape we see today locally.

Our first locality was on a flat area known as the Dressage. At a junction of a track and the road to The Knott, there are several large boulders. These sandstone blocks were clearly moved to their current position at some time in the past. Closer examination shows various features. The 'dished' surface on at least one has small raised bumps which are not fossils as such. They are sole marks and confirm that this block, at least, is upside down!

Jane explained that the road along which we had walked is a glacial meltwater channel. Evidence indicates that this channel was formed by ice margin flow.



The Knott

We continued along the track gently ascending. We stopped and looked out over the Cheshire Plain. In front of us there was a small valley in the direction of a farm which is called Four Winds. The valley is the surface manifestation of an accommodation fault. The banks on the far side of the gully have been downthrown compared to the near side. It was, apparently, possible to find poorly preserved mussel fossils on this near side in the past but everything is covered in vegetation and fenced off now.

We continued uphill until we reached the high point from which we could look towards the Knott, which is formed of an unnamed sandstone between the Milnrow and the Old Lawrence Rock. Jane explained that we may be standing on Old Lawrence Rock at our viewpoint.

Round either side run glacial meltwater spillways. These are probably ice margin spillways as the top of the ice is considered to have been slightly higher. When the ice started to melt there was a considerable amount of water which would have been a very powerful agent for erosion. The channels go either side of the Knott and merge together at what is now a car park and continue down West Park Drive where we were headed.



The Ram Pump, which uses the flow of the stream to pump water up to a storage facility.

Before that we turned to look over the Cheshire Plain again and Jane pointed out a ridge to the left which is probably Kerridge Ridge where there are small active quarries providing sandstone for decorative/rockery purposes. The walls we saw here are made of rock from various parts of the estate with one long section having fairly recently been renewed.

We arrived at a small car park beyond which are some small disused quarries; probably used for walling stone. It was worth a short steep climb to investigate the rocks as dip and bedding could be seen.

Our route took us down West Park Drive, the glacial meltwater channel. It was interesting to compare the width of the valley to the size of the current stream which is really quite narrow – maybe only 1 metre wide in places. We took a short detour to look at some ripple marks in the bedrock of a path before arriving at an area where there are the remains of an old Ram Pump just past the confluence of two streams. We had also noticed some 'leaky dams', which the National Trust has installed to slow the flow of the streams during heavy rain.



Stigmara

Jane explained that a ram pump (one of four or five on the estate) was set up in the 19th century to lift water from the stream to areas of grazing higher up where there was no flowing water for stock. These were lost for a long time but recently one of the volunteers has started to investigate where they are and it is hoped that at least one will be restored to working order. This one seemed to get used as a litter bin.

The valley side here has eroded down and exposed bedrock. Ripple marks and thinly bedded sandstones could be seen. It was here that one of our number found a wonderful piece of stigmara (fossil root) just lying near the stream in amongst the other bits of rock.

Our next stop was in the wonderfully named Deer Clough. The stream here is in a gorge between the Old Lawrence Rock and an unnamed sandstone. It also flows past a cliff showing dipping bedding and over a wonderfully rippled sandstone bedding plane. The ripples look almost 'new'

rather than over 300Ma old and shows that, here at least apparently, there has been very little distortion of the rocks.

The stratification of the rocks here – a mix of sandstones and siltstones – is very clear. Jane indicated that we would see fossil roots and bark which would indicate that the environment of deposition was terrestrial rather than marine (and we had found the *Stigmaria* by then). The environment was probably a river system or perhaps a lagoon with the sandstones being deposited in more turbulent conditions than the siltstones. The jointing is a feature of erosion near the surface as the overburden was removed. This allows the underlying rocks to expand and crack forming joints. The apparent dip of rocks can be seen. Fred Broadhurst in his book says the dip is to the west.



Deer Clough ripple bedding

We then ascended a very steep set of steps, onto a path which runs on a bedding surface. Here we found fossil roots. On the right hand side there were several reasonable sized pieces and further up slope there was a very obvious piece. Jane explained that the rock on which we were standing was a fossil soil in which the roots were growing. It is possible that some of these fossil 'roots' are in fact bits of stem and thus actually are not all of the same age.

Our path continued up through delightful woodland until eventually we came out at the top of a cliff. Now we were looking down on a valley known as Cluse Hey and across Middle Moor towards Park Moor. The land here falls

away dramatically: we were standing on a dip slope and in front of us is the scarp slope. We carefully moved a little closer to the edge so that we could see the scarp edge exposures. We could make out ripples and bedding. The ripple marks must have been covered over quickly after formation to be preserved. Then later erosion has exposed them for us to see.



View over Cluse Hey

From this point Jane advised us that we could also see the meltwater channel of Cluse Hey and how small streams are now eroding into it. There are some examples of interlocking spurs on the longer juvenile streams. Apparently glacial deposits are quite thin here. We were nearly at the maximum height of the ice sheet.

Our next locality was a small cottage, Paddock Cottage, which once was open to the public. It has been on site for a very long time: it appears on a painting of the Elizabethan house. However, now it is off limits but we were able to get close enough to see that there are parting lineations on two of the flagstones by the door. Parting

lineations are bedding surface features that can form in very thinly bedded sandstones and are caused by the alignment of the sediment grains by current flow.

Our walk took us above Cluse Hey for a while and we stopped part way along to look at the view (although it wasn't as clear as it might have been but at least no rain). We looked across Middle

Moor to Park Moor and Bowstones on the horizon. Whilst the area immediately in front of Bowstones is on sandstone, the Wood Head Hill Rock (at the base of Westphalian A), Jane told us that much of the rest of the moorland is underlain by mudstones and the line of the Big Smuts Coal seam.

We paused by a stile into Knightslow Wood and Jane explained how confusing the drainage patterns can be in the Park. We crossed via stone flags a small stream yet about 100m below us is the stream in Cluse Hey. This stream comes along the wall of Knightslow Wood from Park Moor. The Cluse Hey stream also comes through very close to it (though at lower altitude and is not actually related).

Drainage of water from the moors through the Park has caused problems such as in 2019 when there was severe flooding not just in the park but also downstream in Poynton and Bramhall as the streams feed into Poynton Brook. Drinkwater Meadow, over a stone stile to our left, is one of the sites where leaky dams have been installed to slow the water down and hopefully reduce the impact of any really heavy downpours. Other leaky dams have already been installed in Elmerhurst Wood and are being situated in other areas of the park.

After a very pleasant walk through Knightslow Wood, we reached our final locality on Park Moor. On the previous visit to Lyme Park, there had been discussion about the coal seam in the Park. We had viewed from Cage Hill, Coalpit Clough which was an initial source of coal for the estate. The coal seam which runs under it, the Big Smuts seam, is shown inferred on the geological map. It would appear to follow a line which brings it out around here although at unknown depth.

Jane explained that there was mining locally at Poynton and Marple for many years and on Bakestonedale Moor above Pott Shrigley which to the east of Poynton and close to the Park, there is a mine cap with some interesting illustrations.

On our way back to the car park and the cafe Jane pointed out some more large sandstone blocks. Some of these also contain fossil plant material though it was not easy to see.

The group thanked Jane for her interesting trip and half the group repaired to the cafe for tea and cake!

OTHER SOCIETY EVENTS

BCGS <http://bcgs.info/pub/>

22 July	Glacial Boulder Trail 8 - The Illey Valley Wilderness Trail
18 September	The life and work of Sir Arthur Russell
16 October	Conclusion of the Erratics Project
20 November	Origins of Starfish and their relatives

Leeds Geological Society <http://www.leedsga.org.uk/>

5 th October	New techniques used in the study of fossils
2 nd November	Seawater chemistry and mass extinctions

GeoLancashire <https://geolancashire.org.uk/lectures-and-excursions/>

16 th July	Force Crag Mine, Lake District.
30 th September	Alderley Edge: Surface walk AM, down the mine PM.

OUGS North West Branch <https://ougs.org/northwest/>

21 st October	Sea defences at Rossall Beach. Fleetwood, Lancs.
--------------------------	--

GEOLOGIST'S ASSOCIATION ANNUAL CONFERENCE 2023

Kendal



At the Brewery Arts Centre, Kendal: 22nd -24th September 2023

The conference will celebrate the 50th anniversary of the Westmorland Geological Society and the publication of a new GA Guide on the Geology of Cumberland & Westmorland

Provisional Outline Programme:

Friday 22nd September

Visit to Kendal Museum's Mineral and Geology display including a presentation from the Curator.

Canapés and refreshments will be served

Saturday 23rd September

Arrival & Registration

Talks and Posters followed by:

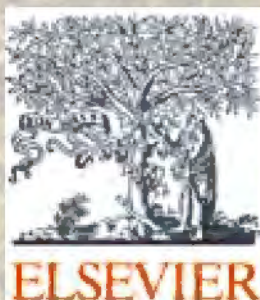
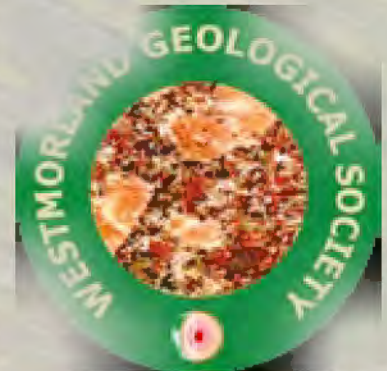
Conference Dinner in the Brewery Arts Centre,
122a Highgate, Kendal, Cumbria LA9 4HE

www.breweryarts.co.uk

Sunday 24th September

A selection of Field Trips

Hosted by Westmorland Geological Society.



Manchester Geological Association

MGA outdoor meetings 2023

Contact: outdoors@mangeolassoc.org.uk

Sunday 16th July. Force Crag Mine, underground visit.
Joint with GeoLancashire. Contact secretary@geolancashire.org.uk for details.

Saturday 2nd September (or Sunday 3rd if weather is 'unreasonable').
North Staffs Group of the Geologists' Association has invited members of the MGA to join this excursion to explore the volcanic rocks above Bonsall Village, one of the four Peak District Carboniferous volcanic centres. Included will be Tearsall Farm, an old fluorspar open cast quarry exposing the Upper Matlock Lava. Leader Dr Mike Allen. Details to follow nearer the time. Please contact the outdoors@ email if interested.

Sunday 30th September. Alderley Edge Copper Mines, underground (Engine Vein) and surface.
Joint with GeoLancashire. Details to follow nearer the time. Limit on numbers, so please contact using the outdoors@ email address.

Indoor Meetings 2023/4

Saturday 14 October. Broadhurst Memorial - Volcanology

Dr Craig Magee (Leeds University), TBC
Prof. Hazel Rymer (formerly Open University), TBC
Tivonne Howe (Lancaster University), TBC

Wednesday 8 November. Zoom meeting

Saturday 9 December. Structural Geology

2024

Wednesday 10 January Zoom meeting

Saturday 10 February 2024 AGM. Presidential address & member presentations

Wednesday 6 March Zoom meeting

Saturday 13 April. Resources