



Manchester Geological Association

President: Jane Michael
2016 Founded 1925
www.mangeolassoc.org.uk

CONTENTS

Page 2	MGA contacts
Pages 3/5	Halkyn Mountain field trip report
Pages 5/8	MGA Outdoor Meetings information
Pages 8/9	Other Society Events
Page 10	MGA Indoor and Outdoor Meetings

QUICK DIARY

Outdoor Meetings

Saturday 1 April. Location: Healey Dell, Rochdale. Leader: Ron Powell

Sunday 9 April Location: Congleton Edge and Mow Cop. Leader :Eileen Fraser

Sunday 16 July Location: Great Orme. Leader: Cathy Hollis

Saturday 5 August Location: Lud's Church and the Roaches – Joint trip with OUGS. Leader: Jane Michael

Sunday 3 September Location: Castleton area. Leader: Lucy Manifold

Autumn (date tba) Location: Rostherne kettle hole and building stones in Rostherne Church

Leader: Rupert Randall (Warden of the National Nature Reserve at Rostherne Mere) and Fred Owen

Date TBA Location: Shap. Leader: Peter del Strother and Jennifer Rhodes

Indoor Meetings 2017/18 (Provisional List)

Wednesday 18 October 2017	7.00pm	Prof Ernie Rutter: Title TBA
Saturday 18 November 2017	1.30pm	Broadhurst Lectures: Deep Earth Matters
Saturday 9 December 2017	1.30pm	Some Aspects of Planetary Geology in the Solar System
Saturday 13 January 2018	1.30pm	Flying Fossils
Wednesday 7 February 2018	7.00pm	Annual General Meeting and President's Talk
Date and speaker TBA	6.30pm	Joint Meeting with Manchester Geographical Association

Who's Who in the MGA Officers

President: Jane Michael BSc (Hons)

Vice-President: Dr Cathy Hollis

General Secretary: Sue Plumb BSc

Membership Secretary: Vacant

Treasurer: Niall Clarke MSc

Indoor Meetings Secretary: Vacant

Field Excursions Secretary: Penny Heyworth MPhil

Newsletter Editor: Lyn Relph BSc (Hons)

Webmaster: Peter Giles MSc

Other elected members of Council

Nicola Fowler BSc (Hons)

Jennifer Rhodes

Peter Gavagan

Brian Smith

Ex officio members of Council

The Immediate Past President, Manchester Geological Association: Dr Ray Burgess PhD

RIGS Representative: Chris Arkwright PhD

The Association's representative on the North West Geologist's editorial team: Peter del Strother MBE MPhil
President of the Student Geological Societies of the University of Manchester

MGA Archivist: Derek Brumhead MBE

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

Halkyn Mountain

by Jane Michael

On the 14th of August Members of the MGA joined OUGS Members at Rhes-y-cae for the annual joint field trip. This year we went to Halkyn Mountain Common SSSI not far from Mold and the A55. The day was in two parts; in the morning we looked at the ecology and industrial history of the area (with a little geology) and after lunch it was geology all the way (well with the occasional rare plant thrown in for good measure).

Our leaders for the morning were Rachel, a Wildlife Warden for the SSSI, and John Watson a Geological and Environmental Consultant who had undertaken a review and risk assessment of the 4000 mineshafts for estate owners (Grosvenor Estates). The area is on the earliest Carboniferous Limestone (Dinantian), a competent packstone, lies directly over older Silurian Shales. The shallow water marine conditions allowed the deposition of a thick succession of limestones – the Cefn Mawr and Loggerheads. The east to west trending faults were mineralised and have vertical movements of up to 36.5m. There are also open fissures that were formed by tension stress. The lodes generally dip between 70° and 80°. Other north-west trending faults formed by compression are not mineralised.



Fig. 1 Poster showing history of the collapse and remediation work.

Age Fort, six villages and 200 residents with grazing rights (although only 12 actively graze sheep). John showed us the history of one shaft-collapse that was very close to the car park (Fig. 1).

To remediate the collapse large plugs of PFA/cement (9:1) were put in the hole; 687 tons of rock and 227 tons of grout were used! Locally sourced topsoil was used to cover this then the area was fenced. It is hoped that the fence will be removed shortly.



Fig. 3 Tunnel in quarry face.

The mineralisation is mainly lead (galena) and zinc (sphalerite); the gangue minerals include calcite, pyrite, chalcocopyrite and fluorspar. After Derbyshire the common land became the second largest lead producer in the UK; 10% of UK production at one stage. Mining ceased in the 1960s.

The Halkyn estate covers 1800 acres, has 4000 mine shafts/deep mines, three active quarries, disused limekilns, Moel y Gyr Iron



Fig. 2 Clywd cap.

After looking round this area Rachel

took us on a walk that encompassed most of the Common. In particular we were able to see at first hand the various types of mine caps in place. One in particular, the Clywd Cap (Fig. 2), was developed locally and won a Prince of Wales Award. These are also used in Cornwall and Derbyshire. We looked down into the Chwarel Pant-y-pwll-dwr quarry where one of the tunnels dug to drain the mines (Fig. 3.) could be seen.

This was mainly in the Loggerheads formation. We climbed to the Trig Point at 294m where we had excellent views of



Fig. 4 The Knocking Stone.

the Dee Estuary, Blackpool Tower (just), Liverpool Anglican Cathedral, the Clywdians and Snowdonia. After passing by the Knocking Stone (Fig. 4) where the ore was broken up, looking at rare Stemless Thistles and the lead ore washing areas, we visited the lime kilns where we found crinoid fossils and the occasional productid. The limekilns (Fig. 5) have been restored with small holes left in the brickwork for bats.

John and Rachel then left us having been thanked by Pam Norris for such an interesting morning. We drove to Halkyn village where we had lunch at the local community pub – the Bluebell. Our afternoon leader, Tony Kirkham, took us on a tour of various quarries to investigate the limestones and finally the Pentre Chert formation. He had produced an excellent handout with colour photographs of various aspects of the quarries and, as these had been taken over a number

of years, it was very interesting to see how the sites had changed through time.

We recommenced at the Waenbrodilas Quarry that is still working.

It is set in the Brigantian age Cefn Mawr Limestone formation that is generally dark carbonates. It is easy to tell them apart from the Loggerheads formation, as the latter are much paler. As with everything, just because a limestone was light coloured, it did not mean that it was the Loggerheads formation as some of the Cefn Mawr formation limestones are also



Fig. 5. The Lime Kilns.

pale; this has been interpreted as them having been re-sedimented. There is a very dark band of shale, up to 3m thick, that crosses the quarry and acts as a good marker bed. This is the Waenbrodilas Shale (Fig. 6 Tony in the quarry).



Fig. 6 Tony in the quarry.

Tony said that the depositional environment of these limestones was considered to be a carbonate ramp, distally steepening, eventually developing into a rimmed platform with a very steep frontal edge. Mud mounds seem to have formed on this front and later slumped. We saw several examples of slumping within the beds. Whilst in the past, faults could be seen in the quarry, we could no longer see the rollover anticlines in the hanging wall so took his word that the faults were listric. He informed us that there were

two major oblique faults that appeared to have operated as a pair and this had probably been the cause of the slumping. A thrust fault could be made out above the shale, but it petered out in the quarry in a decollement.

We moved on, not far, just around the corner to a disused part of the quarry. This exposed the Pentre Chert formation (Namurian), which is the thickest chert formation in the UK – there certainly was a lot (as we were to see near the end of the trip). As Bryn Mawr Quarry (now subsumed into Waenbrodilas) chert had been quarried rather than limestone (Fig. 7).

The source of the silica for the chert was discussed, but no firm conclusions were reached. Siliceous skeletons have been found in the chert, but not in the abundance required



Fig. 7 Banded chert.

for the volume of chert produced, but it is likely to be of biological origin. We also saw what Tony considers is a Neptunian dyke (where a crack in the sea floor is in-filled with sediment). He postulated that there is a tendency for rimmed carbonate platforms to lose their edges resulting in debris flows. This debris can fill cracks in the sea floor. Certainly there was an area where the rock was definitely mashed up (although now heavily vegetated this could just about be seen).

The final stop was at the disused Pen-yr-Henblas Quarry that showed the extent and thickness of the chert. Bedding was seen easily and there were many examples of fine lamination indicating quiet water. There had been two phases of chert

formation. Again we saw slumping down slope to the northeast indicating instability in the sloping area of the platform. Looking at the bigger picture (by way of a long rock face probably 100m long) we could see what appeared to be a river channel, possibly with others nested in it especially near the edge. There seemed to be slumping into the main channel. It was suggested that perhaps turbidites flowed down the platform slope had resulted in channels with further slumping into these at a later date. Nothing was straightforward!

The trip finished at this point (although a few people moved on to look at the view over Pant Quarry) and Pam thanked Tony on behalf of everyone for a thought provoking and interesting afternoon.

Protecting the Geological Heritage of Greater Manchester

by Dr Christine Arkwright

Wednesday 29 March 2017

Most people have heard of Sites of Special Scientific Interest (SSSIs), which have legal protection as nationally important biological and geological sites, but perhaps not as many know about Regionally Important Geological and Geomorphological Sites (RIGS). Although not as legally binding as SSSIs, a RIGS designation does give some protection in planning law to examples of the local geology, thus helping to conserve the geodiversity of that area.

Within the Greater Manchester (GM) area there are huge depths of sedimentary strata from Carboniferous to Triassic in age, including many examples of plant and animal fossils, sedimentary features, tectonic structures and surface geomorphology, all of which are your local geological heritage. This talk will explain how the GMRIGS Group is trying to protect this for future generations, our progress up to now, and plans for the future.

There is also an associated field trip on Saturday 1 April. See details below and on the MGA website.

Saturday 1st April 2017. Healey Dell Rochdale. Leader: Ron Powell

Ron Powell (a member of MGA and GMRIGS) will take us around the nature reserve Healey Dell in Rochdale to point out the many geological features to be found there and explain how these will help us to evaluate the site's potential as a RIGS.

Contact for more details and to book:

chrisarkwright1@gmail.com

Phone 01772 335316

Tebay-Shap area geological field excursion

led by Peter del Strother and Jennifer Rhodes

May/June

This is a full day excursion; we will investigate several sites in the Tebay/Shap area including Silurian turbidites, Shap granite, Carboniferous limestone and striking geomorphological features plus a stone circle made from Shap granite erratics.

Part of the excursion will include a visit to the pink Shap Quarry, which is a working site. Hard hats, boots and hi-viz waistcoats will be required and should be brought by participants. Numbers will be limited to 12 participants. The itinerary will be arranged to fit in with the working quarry's operations.

We shall be walking about 2km in total on tracks, but there are grassy slopes at several locations. There may be an opportunity to buy refreshments at Shap Wells Hotel.

Date in May/June to be confirmed with the quarry management. Please see the MGA website for details.



Fieldtrip to Great Orme, Llandudno, North Wales

Leader Cathy Hollis

Sunday 16th July 2017

This one day fieldtrip will examine the spectacular outcrops of Lower Carboniferous limestone that are exposed on the Great Orme, Llandudno. The sediments were deposited on a shallow water carbonate platform that extended from the Llandudno area southwards to a palaeo-landmass (St Georges Land). The sediments show a well developed cyclicity, forming packages that are tens of metres thick and capped by palaeo-soil horizons, providing evidence that the platform periodically became emergent. The field trip will examine these cycles and also spend time (tide-permitting) discussing the importance of faults to dolomitisation and mineralisation of the succession. Walking will mostly be on well-made paths.



Cyclic stacking of Lower Carboniferous Limestone, Great Orme, Llandudno

Fred Broadhurst Memorial Field Trip 2017

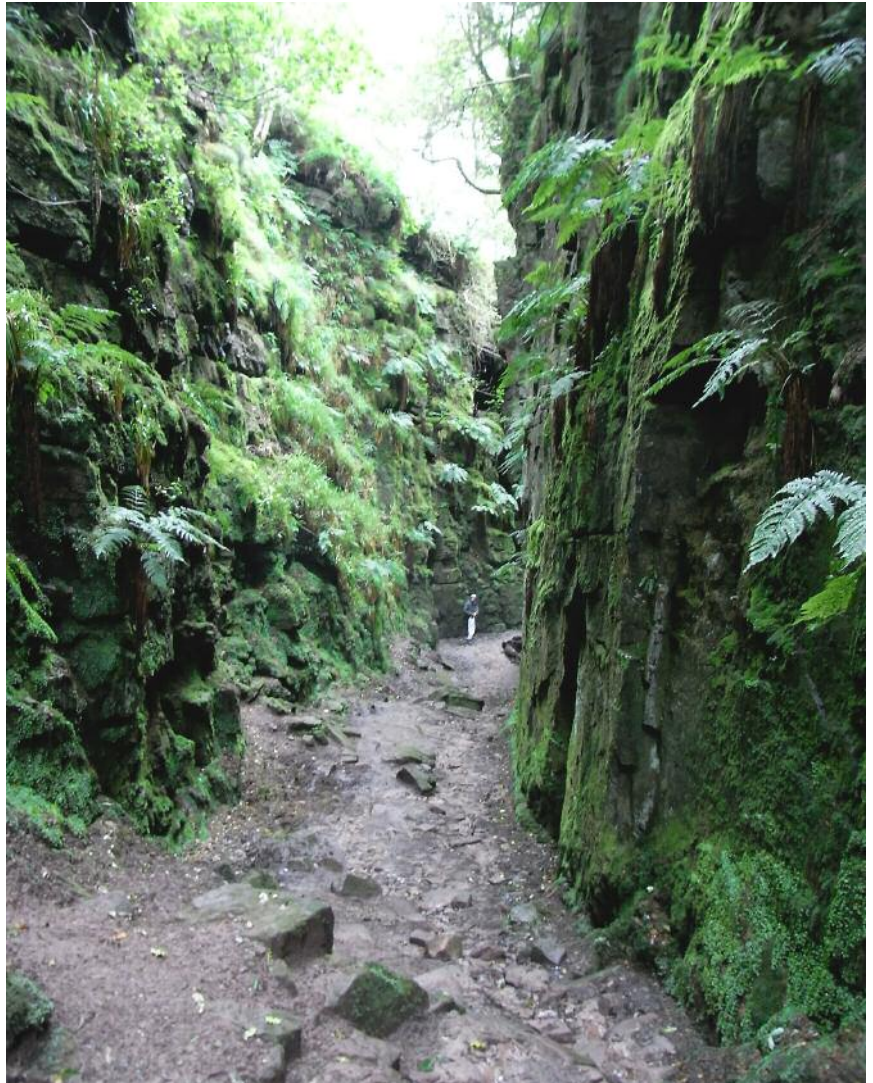
Saturday 5 August 2017: The Roaches and Lud's Church

Leader: Jane Michael

For this year's trip, which is a joint event with the OUGS North West, I am proposing to do a version of Walk 8 from Rocky Rambles: The Roaches and Lud's Church. During the trip, the itinerary of which has not yet been finalised, we will visit the mysterious cleft that is known as Lud's Church with its atmospheric woodland surround and wonderful green, damp interior and also see some spectacular cross-bedding and views of the Goyt Syncline.

The walk will be between 5 and 6 miles with, probably, an occasional steep ascent (I will try to keep this to a minimum), but it will be worth the effort. Not only is the geology excellent, but the history (and natural history) is fascinating. We're going in August so the weather will be glorious (no promises but it should be warm!). And at the end (possibly lunchtime too) there may be icecream!! What more can you possibly want!! Places are limited to 20 and some have already gone, so book early for what I am sure will be a popular trip.

Contact: 58rockchick@gmail.com>



Fieldtrip to the Lower Carboniferous margin of the Derbyshire Platform

Leaders: Lucy Manifold and Cathy Hollis
Sunday 3rd September 2017

This excursion will examine the sedimentology of the northern margin of the Derbyshire Platform, focusing on the Castleton area. In the Lower Carboniferous this region was located on the margin of a steeply dipping carbonate platform. Present day exposure within disused quarries and along public footpaths allows a cross section of facies from the platform top, across the platform margin and into the basin, to be examined. The trip will involve walking on rough, but well-marked, paths between Castleton, Cave Dale and Pin Dale.



Lower Carboniferous limestone on the northern margin of the Derbyshire Platform, Pin Dale, near Castleton.

OTHER SOCIETY EVENTS

OUGS <http://ougs.org/branches/index.php?branchcode=nwe>

June 17th 2017 (Saturday)

Geology of the Wirral. Leader: Hilary Davies (ex-OU tutor)

Wirral, Merseyside.

July 22nd 2017 (Saturday)

The Pennine Escarpment and High Cup Nick

Leader: John Rodgers (CGS)

A traverse from the low-lying Eden Valley, over the Cross Fell Inlier and up onto the Pennine Escarpment at High Cup Nick (the Whin Sill).

September 9th 2017 (Saturday)

Conservation work on limestone pavement near Silverdale

Leader: David Wrigley (Butterfly Conservation Trust)

A working party to help clear vegetation from limestone pavement for the Butterfly Conservation Trust at Myers Allotment near Silverdale.

25th – 30th September 2017

OUGS NW Branch Trip to the Apennines in N. Italy led by Giancarlo Molli (Pisa Uni)

25th – 30th September 2017. Provisional Itinerary see website.

November 25th 2017 (Saturday)

Winter Lectures and Social afternoon. Rainhill Millennium Hall. Three lectures given by academics, plus free refreshments, library and chat.

Black Country Geological Society <http://bcgs.info/pub/>

22 April, 9:30 Field Visit - Mortimer Forest

24 April, 7:30 A Teacher's View of Glacial Geology

20 May, 10:00 Field Visit - Return to the Brymbo Fossil Forest

17 June, N/A Field Visit - Visit to the newly refurbished Lapworth Museum.

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

Lecture Programme

23 MAR 17 Yorkshire: a Land of Ice and Water in the Late Quaternary

Speaker: Prof Mark Bateman Sheffield University.

22 APR 17 (Saturday)

The Geology of Your Shopping Basket

National Coal Mining Museum, Wakefield:

Launch of Yorkshire Geology Month

27 APR 17

The End-Triassic Mass Extinction: What Went Extinct and Why

Dr Alex Dunhil. Leeds University

11 MAY 17

Imaging Life on Earth

Prof Phil Manning. Manchester University

12 OCT 17

The Aberfan Disaster: Learning From the Past

Dr Helen Reeves. BGS

21 OCT 17 (Saturday)

Cave Science Symposium

Joint Meeting with BCRA and YGS

09 NOV 17

Geological Mapping of the Chalk Aquifer: A Hydrological Case Study From the Yorkshire Wolds. Dr Andy Farrant. BGS

07 DEC 17

AGM and Conversazione –Short Talks and Displays by Members.

North Staffordshire Group of Geologists Association

<http://www.esci.keele.ac.uk/nsgga/>

Winter Lecture Programme 2016-17

Thursday 30th March 2017

'Geological perspectives on the 'world's largest' conventional explosion at Fauld Mine, Staffordshire'. Dr Noel Worley.

Summer Field Programme 2017

Wednesday 19 April - Thursday 27 April, 2017.

NSGGA Fieldtrip: Assynt & Coigach (NW Highlands Geopark), Scotland. Leader: Patrick Cossey.

See website for details

Manchester Geological Association

OUTDOOR MEETINGS

Date **Saturday 1 April** Location: Healey Dell, Rochdale

Leader Ron Powell

Notes Ron Powell (a member of MGA and GMRIGS) will take us around the Healey Dell Nature Reserve, which is in Rochdale, to point out the many geological features to be found there and explain how these will help us to evaluate the site's potential as a RIGS.

Contact Chris Arkwright, telephone 01772 335316

Date **Sunday 9 April** Location: Congleton Edge and Mow Cop

Leader Eileen Fraser

Contact Field Excursions Secretary

Date **Sunday 23 July** Location: Great Orme

Leaders Cathy Hollis

Notes Looking at the Lower Carboniferous. Focus on two things: the evidence of carbonate platform deposition and the effects of exposure (so karstification, formation of soils, etc) and dolomitisation.

Contact Field Excursions Secretary

Date **Saturday 5 August** Location: Lud's Church and the Roaches – Joint trip with OUGS

Leader Jane Michael

Notes Note that this is a joint trip with OUGS and is likely to be fully booked early.

Contact 58rockchick@gmail.com>

Date **Sunday 3 September** Location: Castleton area

Leader Lucy Manifold

Contact Field Excursions Secretary

Date **Autumn (date tba)** Location: Rostherne kettle hole and building stones in Rostherne Church

Leader Rupert Randall (Warden of the National Nature Reserve at Rostheme Mere) and Fred Owen

Contact Field Excursions Secretary

Date **Date tba** Location: Shap

Leader Peter del Strother and Jennifer Rhodes

Notes Carboniferous limestone, then the Silurian turbidites and the basal Carboniferous unconformity at Shap Wells Hotel to the granite quarry (it is of interest from a hard rock and geomorphological perspective).

Contact Field Excursions Secretary

Indoor Meetings 2017/18 (Provisional List)

Wednesday 18 October 2017	7.00pm	Prof Ernie Rutter: Title tba
Saturday 18 November 2017	1.30pm	Broadhurst Lectures: Deep Earth Matters
Saturday 9 December 2017	1.30pm	Some Aspects of Planetary Geology in the Solar System
Saturday 13 January 2018	1.30pm	Flying Fossils
Wednesday 7 February 2018	7.00pm	Annual General Meeting and President's Talk
Date and speaker TBA	6.30pm	Joint Meeting with Manchester Geographical Association

Meetings from October to February inclusive will be held in the Lecture Theatre in the Williamson Building, Oxford Road, Manchester.

Further information regarding speakers and lecture titles will be announced later in the year.