



Manchester Geological Association

President: Jane Michael

December 2017

WWW.mangeolassoc.org.uk

Founded 1925

Annual General Meeting

It is nearly time for the AGM when the Council is elected. We are always on the look out for new Council members. We're not looking for anyone to fill any of the named positions so please don't be put off offering by the thought you have to take one on. We're looking for people who just want to get involved in running the Association, putting forward new ideas for events, talks etc. If you are interested, please contact Sue Plumb (secretary@mangeolassoc.org.uk) and let her know.

Jane Michael

President

Message from the President

I just would like to wish all members a very Merry Christmas and a Happy, Peaceful and Healthy New Year. This is the last newsletter when I will be President and I would like to add my thanks for being given the opportunity to do this. I have enjoyed it very much. Thank you for your support. Please give my successor (in February), Cathy Hollis, the same support you have given me; she will be an excellent President.

Jane

Quick Diary

Saturday 13th December 1.30pm Flying fossils

Wednesday 7th February 7.00pm AGM and talk by
Jane Michael: Aspects of North Island NZ Geology

14th or 21th March Talk

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: Prof. Ray Burgess

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

Indoor Meetings 2018/19

I am starting to put together next year's programme and it has been suggested that the October evening meeting could be a 'Members Holiday Geology' event. By this, I mean members giving a short talk, (no more than 10 minutes) on the geology they saw whilst on holiday. It doesn't have to be particularly technical, just slides and descriptions of what you saw. I know that many of you go to some fairly exotic places where I am sure you see stunning geology but those who don't may well have been to visit locations in Britain with interesting scenery. If you need help putting a presentation of your photos together, don't worry - we can help with that. All you would need to do is stand up, tell us what you saw and how beautiful/interesting it was.

So don't be shy: the audience is very friendly (believe me, they are!). If you really don't feel up to doing the talking, one of the council members will be willing to do it - but you will have to tell them what you saw!!

So please contact me (lectures@mangeolassoc.org.uk) to say you are interested and I'll sort the rest out.

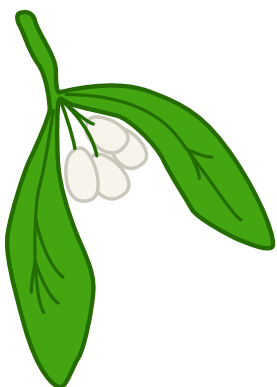
Jane Michael
Indoor Meetings Secretary

Abstract for the Science and Engineering of Shale Gas

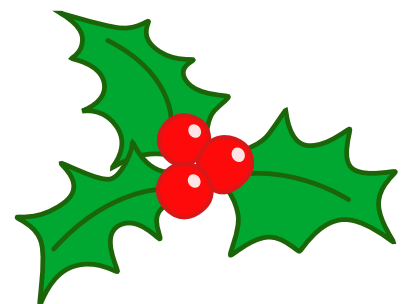
Unconventional gas occurs in tight rocks, such as shales and low permeability sandstones. The low permeability means that extraction via radial flow to vertical boreholes is too slow. Given that tight gas occurs in bedded formations the development of horizontal drilling, with multiple parallel wells, was the key technological advance allowing exploitation because the borehole sees more of the reservoir formation. This is not enough, however, and multiple stages of hydraulic fracture are generally required in each well to increase area to which gas can flow, allowing the whole formation to be 'mined' for gas.

Natural gas is a clean fuel, but it is also a vital raw material for the chemical and fertiliser industry (without which 2.3 billion people cannot live on this planet). High pressure steam reforming from natural gas is likely to be the main way that industrial quantities of hydrogen can be produced for electricity generation, transport and domestic heating. The downside is the production of carbon dioxide, hence it is essential that CO₂ capture and storage should be part of the future use of gas. Gas should be seen as potentially having a long-term emissions-free future. The only difficulties should be in finding engineering solutions to the extraction and environmental concerns.

Speaker: Prof. Ernie Rutter, University of Manchester, October 2017'



A very happy Christmas
from your Editor
Lyn



Joint MGA GeoLancashire field excursion to the Shap area on the 1st of June 2017

By Peter del Strother

A group of about twelve people met at Shap pink quarry to which access had kindly been granted by Armstrong Ltd.

The quarry has recently been reopened and loose blocks provided plenty of new surfaces for inspection. For safety reasons the main face was not approached. From a distance at least two suites of cross-cutting joints were observed.

Examples of dark and light granite facies were identified. Basic enclaves with and without the pink potassium feldspars were also seen. These are thought to represent an early primitive Shap magma stage formed during mixing of basaltic magma and the granite host.



A small number of potassium feldspars were surrounded by pale halos. Similar halos are seen in Rapakivi granite. However, here the feldspars retain their original crystal form and cleavage (Fig 1).

No-one present was able to provide an explanation of this phenomenon. The author has since tried to find peer reviewed papers on the subject, and failed. Can anyone help?

Fig. 1 Three feldspar phenocrysts with pale halos. (Pencil 6 mm wide)

showed the temperature of the intrusion was clearly not high enough to alter the texture of the country rock.

Hand specimen of the contact between Shap granite and country rock. On the other side of the specimen the long axes of feldspars, close to the contact, are aligned parallel with it (Fig. 2).

The next stop was Shap blue quarry. We are most grateful to Paul Jennings of CEMEX who led a fascinating tour of this quarry. The quarry, which is within the metamorphic aureole of the granite, is famous for the occurrence of garnets in mineralised joints (Fig. 3).

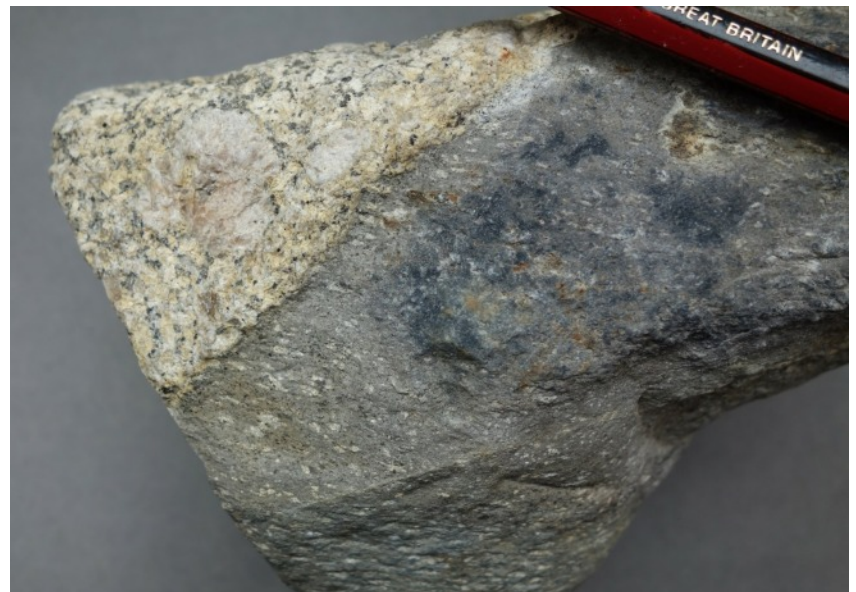


Fig. 2 Hand specimen of the contact between Shap granite and country rock (Pencil 6 mm).



Fig. 3 Garnets in mineralised joint in Shap blue quarry. (Large garnet about 10mm across)

The quarry is worked at a number of levels, which was fortunate because during the torrential rain of Storm Desmond in December 2015 about 12 inches fell locally in 24 hours. The lowest part of the quarry became a lake more than 20 m deep and took several days to pump out.

With permission from CEMEX an exposure in a stream between the blue and pink quarries was visited. Here could be

seen aplitic veins of granite, several tens of millimetres thick extending into the country rock. Some contained potassium feldspar phenocrysts.

The group took lunch by the stream at Shap Wells hotel, serenaded by a noisy cuckoo. We expressed thanks to the hotel staff for permitting us to park cars in the hotel carpark. The basal Carboniferous unconformity was examined. Feldspar phenocrysts were seen in the conglomerate (Fig. 4). Fortunately the water level in the stream was sufficiently low for the braver members of the group to cross, albeit at a cost of some wet feet.



Fig. 4 Feldspar phenocrysts preserved in basal Carboniferous conglomerate near Shap Wells Hotel.



The group then moved on to Orton. A track near Gamelands stone circle (Fig. 5) leads onto the local typical stepped limestone topography. Gamelands consists of a circle of Shap granite erratics nearly a cubic metre size. The circle is thought to date between Late Neolithic and Middle Bronze Age. It is a scheduled Ancient Monument – see Historic England List Entry Number: 1011138.

Fig. 5 Gamelands stone circle.



Fig. 6 *Syringopora* and an unidentified brachiopod (right). (Field of view approx. 150mm).

The erratics are deeply weathered and typical of many that can be found on nearby hills and fields. The track ends at a lime kiln beyond which is a small quarry in the Ashfell Limestone of Holverian age. Examples of the tabulate coral *Syringopora* (Fig. 6) and the calcareous sponge *Chaetetes* (Fig. 7) were prominent.



Fig.7 *Chaetetes* (Field of view approx. 100mm)



Fig 8 Base of turbidite unit showing a texture which probably reflects an interaction between bedding and cleavage.

Pushed for time the group moved on to have a brief look at the Silurian turbidites that are exposed in road cuttings near the M6.

Cleavage

bedding relationships were discussed and how these relate to adjacent synclines and anticlines. Flute casts were observed and textures, which were probably the result of bedding cleavage interaction could, be seen on some bedding parallel surfaces (Fig. 8).

The leaders were thanked and members made their various ways back home.

Links of interest from Niall and Jane

Apologies if you are already aware of this but today's 'Inside Science' on BBC Radio 4 had two articles with geological themes. One around the human contribution to earthquakes and another on the 50th anniversary of plate tectonics.

<http://www.bbc.co.uk/programmes/b096gjwg#play>

Also these links might be of interest

<http://www.bbc.co.uk/news/science-environment-41472281>

<https://www.mckenziearchive.org/>

Beyond4CS <https://beyond4cs.com/free-gemology-courses-and-resources/>

We are in no way endorsing these website but they have been drawn to our attention.

Fred Broadhurst Memorial Field Trip

Saturday 5 August 2017

By Brian Smith

Introduction

This annual commemorative field trip to Lud's Church and the Roaches was led by Jane Michael and attended by ten Members of the MGA and the OUGS. The route started from the car park in Gradbach and, after a visit to the tors above the Black Brook, we reached the impressive rift of Lud's church. From here a short, if steep, climb to Roach End and then onward (and upwards) to the trig point on Roaches Ridge. Here we broke for a well-earned lunch before walking back (thankfully downhill) through Forest Wood to the Black Brook and the café at Gradbach Mill.

Location 1

At the carpark Jane gave us an over-view of the area and what we could expect to see. Then we moved off to the side of the River Dane where we could see, on the far bank, signs of hummocky soil from land slips further up the hill. Unfortunately the view was obscured by the trees (Fig. 1) but we could just see the slip effects.



Fig. 1 Signs of landslip on the banks of the river Dane.

Location 2

With the river behind us we followed the road towards Gradbach Mill stopping on the way to examine a small exposure of probably Chatsworth Grit that had been exposed during the construction of the road. It was over-grown but the bedding planes and dips were just visible.

Location 3

From the exposure we walked along the road to Gradbach Mill. The mill, built in the 1780's, was originally used for the processing of flax for jute production; later it was converted into a saw mill. Recently it has been developed as a conference centre. Jane explained that, as a water mill, it had a wheel with a diameter of 38 feet and a gearing ratio of 1: 2500! (Some speed for a water mill).



Fig. 2 Exposure of the Roaches Grit, river Dane.

Location 4

After a short walk through Forest Wood we reached the Scout camp and, looking across the flat ground, we could see how the river Dane had incised into the valley floor. On the far bank we could see an exposure of the Roaches Grit. It was noted that it appeared to dip eastwards. Regrettably we were unable to get closer to examine it in detail. (Fig. 2)

Moving on we reached the confluence of the river Dane and the Black Brook. (Fig. 3)

The beds of both rivers contained a number of large boulders. Jane indicated that they were deposited by the river when the water flow was much higher than today; possibly quite recently. Some may have washed down from the sides when the river incised the bank.

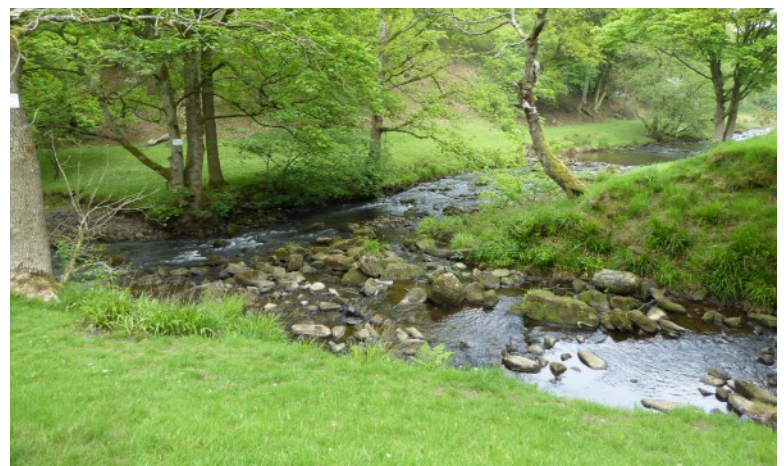


Fig. 3 Confluence of the river Dane and Black Brook.

On the banks of the river Dane there is evidence of river terraces; signs of the past river levels. (Fig. 4).

Location 5

Climbing up through Forest Wood we reached **Castle Rocks**; the tors that stand above the woods. (Figs 5 and 6). We paused here to give everyone a chance to examine the formations. Formed of Roaches Grit they exhibited good examples of cross bedding and extensive jointing. A wide range of grain sizes is indicative of changes in the dispositional environment. Large fallen blocks were scattered around the site. The land-slippage is post glacial and there is evidence that the movement is still occurring.

Location 6

Leaving the tors we climbed up to Lud's Church. This unique feature in the Roaches Grit provides an atmospheric environment that has a long history of religious persecution and ancient folk law. As we approached Jane explain some of the history and a general description of the site (Figs 7 and 8).

The rift runs approximately SE to NW with a land-slip on the NE side; it is thought to be post glacial. It is about 100m long and 15m wide at the top, narrowing as it reaches the path at the base. As it is a popular visitors spot some effort has been made to provide a safe path through the gorge.

The cause of the landslide is not known, but is possibly due to erosion at the base by the river (Black Brook) as happened in Edale. Gravity and a possible slip plane, maybe a layer of mudstone/shales, allowed the land to move and tilt on mass.

As we walked through the gorge we noted an example of fossil wood (Fig. 9) in the path. It was surmised that this would have been carried by the water that laid down the Roaches Grit.

Location 7

Having passed through Lud's Church we continued our climb through the woods to Roach End; the end of the Roaches themselves. At the crest we had a spectacular view **east** across the Cheshire Plain towards Macclesfield and **north** the peak of Shutlingsloe.



Fig. 4 Terracing on the banks of the river Dane.



Fig. 5 Castle Rock.



Fig. 6 Rock falls at Castle Rock.

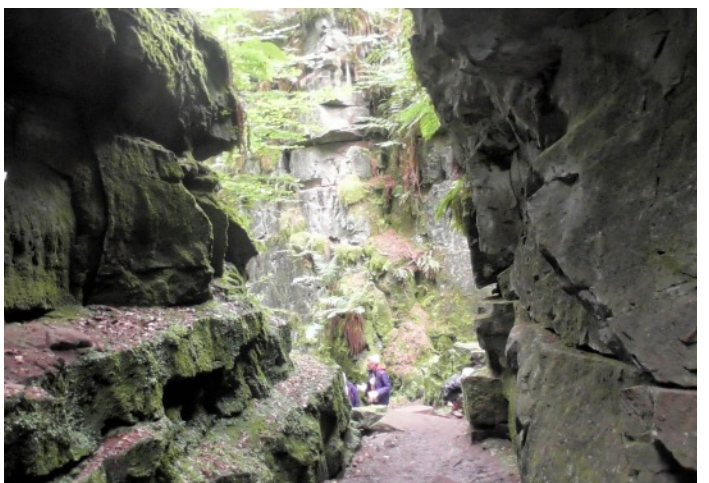


Fig. 7 Entrance to Lud's Church rift.

Location 8

Slightly tired and wind swept the party reached the trig point on the Roaches. It afforded us a fantastic view across the Cheshire Plain and beyond (Fig 11) including a very good view of the Goyt Syncline (Fig. 12).

Battling against the wind Jane indicated the shape of the syncline, the dip and scarp slopes and some of the drainage basin that fed the Black Brook. Ramshaw rocks, shown in Fig. 12, scarp slope is not visible as it dips away from our location.

Seeking shelter off the trig point, and with one eye on the ominous clouds gathering in the distance, we all enjoyed our lunch.

Using the shelter from the wind Jane took the opportunity to explain and point out the features of the syncline. She indicated the changes in

vegetation that showed the changes in rock types from the Rough Rock to the Woodhead Hill Rock. The exposure of the differentially eroded rocks of the tor provided good 3D exposures; a lively debate ensued about the cross bedding, deposition and processes involved (Fig. 13 and 14).



Fig. 8 Ludds Church.



Fig. 9 Fossil wood at the base of Ludds Church.



Fig. 11 Cheshire Plain from the Roaches.



Fig. 12 Goyt Syncline from the Roaches.

Location 9

Following the path back down from the tor (and the impending rain) we returned to Forest Wood and followed the course of the Black Brook until we reached a point where the rock on the far bank was exposed (Fig. 15). Here we could see the bedding planes, the jointing and possibly a small fault. It was obvious from the bank sides that the Black Brook had incised deeply into the valley bed and from the size of the bed material the flow rate, even in normal conditions flow was quite high.

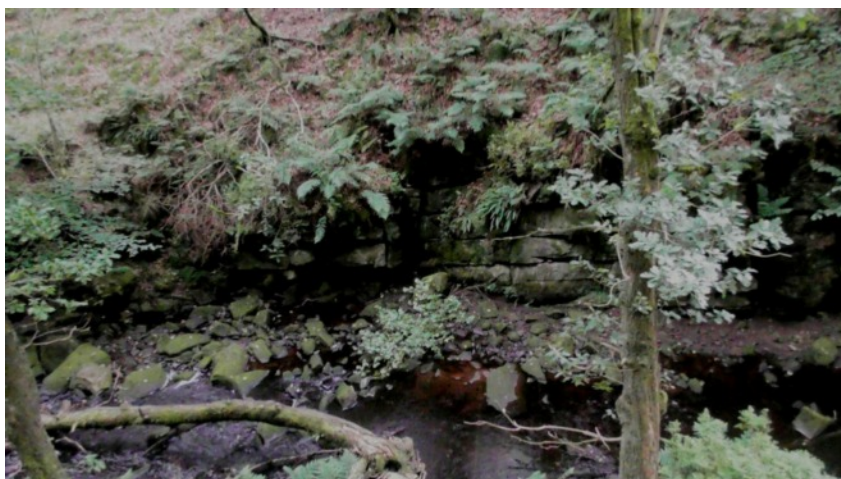
Unfortunately by this time the rain had started and we made our way back to the café at the Mill where we posed for a group photo and enjoyed a relaxing drink.



Fig. 13 Differentially eroded rocks on the Tor.



Fig. 14 Group examine the bedding on the Tor.



It had proved to be an interesting and most enjoyable day and all thanks goes to Jane for the excellent commentary and organisation.

Fig. 15 Exposure in the Black Brook bank.



View from the Roaches

OTHER SOCIETY EVENTS

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

Thursday 11 January 19:30 'The great 1815 eruption of Tambora and future risks from large-scale volcanism' by Dr Ralf Gertisser, University of Keele.

Thursday 22 February 19:30 'The origins and evolution of the River Trent during the Quaternary: new insights' by Professor David Bridgland, University of Durham.

Thursday 8 March 19:00 AGM and Chairman's Address by Dr Stuart Egan, University of Keele.

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

15 January 7:30 'King Coal'. Speaker: Alan Hill

27 January 10:30 Geoconservation day, Barrow Hill

10 February 10:30 Geoconservation day, Wren's Nest

19 February 7:30 'Gemstones'. Speaker: Gwyn Green, FGA

OUGS Northwest <http://ougs.org/northwest>

June 6th–10th, Geology of Anglesey Leader: Dr Chris Arkwright

September 7th–11th. Leader: Phyllis Turkington The north Antrim Coast including the Giant's Causeway

NWGA <http://www.ampyx.org.uk/cdgc/rhaglen.html>

Saturday 27th January 10am. AGM and lecture

Manchester Geographicals

All lectures are to be held at Manchester Metropolitan University, Brooks Building

Thursday 18th January 2018. 17.15 Researching Seismicity. Speaker Dr. Elizabeth Day. Imperial College, London.

Tuesday 6th February 2018. 17.15 Water, Carbon, Weather and Climate. Speaker: Dr Sylvia Knight, Royal Meteorological Society.

Tuesday 27th February 2018. 17.15 The Herbertson Memorial Lecture. Urban Sustainability: The Case of Manchester. Speaker: Dr Mike Hardman. University Of Salford.

Membership subscription renewals

Dear member, we could not run the association without your financial support for which we are very grateful. Membership renewal is due on January 1st.

If your contact details have changed please let me know, in particular email addresses which can change more frequently than other details.

If you renew by standing order, I would be grateful if you could email me to confirm this so I can check I have the correct email for you.

Subscriptions remain unchanged for 2018, that is now five years without an increase!

**Full membership is £16.00 (or £18.00 if you wish to receive correspondence in paper format)
Full +Associate membership is £18.00 (or £20.00 if you wish to receive correspondence in paper format)**

So, if you currently receive correspondence in paper format, you can save £2 by switching to email based communications!

If your contact details have changed please let me know, in particular email addresses which can change more frequently than other details.

If you want to switch to payment by standing order, please let me know and I'll send you the form.

Gift Aid is an important source of income. If it has been some years since you completed a Gift Aid declaration your tax status or address may have changed. The declaration template is included below if you need to update your details.

My contact details are email: niallclarke01@gmail.com / 64 Yorkdale, Oldham, OL4 3AR.

Thank you
Niall Clarke



Gift Aid Declaration

Title.....

Full Name.....

Full Address.....

.....

Post Code.....

I wish my subscriptions and/or donations to the Manchester Geological Association, paid in the current tax year and hereafter, to be treated as Gift Aid donations.

SignedDate.....

Please note that:

- You should have paid sufficient tax in the year to cover the amount to be reclaimed.
- You may cancel this Declaration at any time, by informing the MGA Membership Secretary.

Please send completed form to the Treasurer: Niall Clarke, 64 Yorkdale, Oldham, OL4 3AR.