Manchester Geological Association

President: Dr Ray Burgess
December 2015

Founded 1925 www.mangeolassoc.org.uk

CONTENTS

Wishing all MGA Members a very Merry Christmas and a Happy New Year from your Committee.

WINTER LECTURES

Saturday 5 December 2015 at 13:30.
The original programme, on palaeoclimatology, had to be cancelled because of the unavailability of some speakers. It will be rescheduled. However, to avoid disappointment to anyone attending unawares, two talks by members of Council were arranged; The Geology of Japan and The Bridgewater Canal.

Wednesday 10 February 2016 at 19:00. AGM followed by Presidential Address

Wednesday 2 March 2016. Start time tba. Joint Meeting with the Geographical Association.
Past Eruptions and Future Risks; should we be concerned about Iceland's volcanoes by Professor Fiona Tweed, Stafordshire University

Saturday 12 March 2016. The Broadhurst Lectures.
Talks on New Zealand tectonics. This is likely to be an all-day event.

Who's Who in the MGA
Officers

President: Ray Burgess PhD

Vice-President: Jane Michael BSc (Hons)

General Secretary: Sue Plumb BSc

Membership Secretary: Vacancy

Treasurer: Niall Clarke MSc

Indoor Meetings Secretary: Vacancy

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

Norma Rothwell

Ex officio members of Council

The Immediate Past President, Manchester Geological Association: Peter del Strother MBE BSc CEng MIMechE MBA MPhil

RIGS Representative: Chris Arkwright PhD

The Association's representative on the North West Geologist's editorial team: Peter del Strother MBE BSc CEng MIMechE MBA 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

Manchester Geological Association

Annual General Meeting

will be held in the Williamson Building on Oxford Road

Wednesday 10th February 2016 at 19:00

followed by Presidential Address

The Secretary will be sending out the AGM papers to all members in January, which will include the agenda, officers' reports and title of the talk.

There are currently vacancies on the MGA Council and we are hoping that people will come forward to fill these; as from the forthcoming AGM in February 2016. If you would like to get involved please contact the General Secretary, Sue Plumb, at secretary@mangeolassoc.org.uk, or ring her on 0161 427 5835 for a chat.

William Smith Centenary

This is a site well worth visiting – William Smith interactive maps can be found at http://www.strata-smith.com/ There are old maps and cross sections as well as modern graphics; I liked the fly through clips. Editor.

Lion Salt Works Restored to Life

report by **Fred Owen**

Fig. 1 Before restoration © F Owen

Soon after I began to study geology, in 1997, Alison Scott arranged a visit to the Lion Salt Works at Marston near Northwich. I went along to see what remained of the dilapidated buildings of the works, which ceased production in 1986, and to discover how table and cooking salt had been produced from brine by the 'open pan' method. The buildings were Grade 2 listed in 1986 and designated a Scheduled Monument by English Heritage in 2002. Since then I have driven past the boarded-up site many times and reflected on what a further ten years of decay had inflicted on the site (Fig.1). In 2008, after much research and hard work, funding was secured to restore the Lion Salt Works as a museum; at a cost of £10m. Restoration work began in July 2009, was completed in September 2014, and the Works re-opened in June this year. Ref. 1.

Fig. 2 The 'Rock Stars' in front of the brine tank

On 4th November Marketing Cheshire (of Chester and Cheshire West Council) organised a 'Geology Event' at the Works especially for geologists (referred to in the press release as 'Rock Stars'! Ref. 2) representing organisations both locally and nationally. I was delighted to represent the MGA along with Past President, Peter del Strother. It was also encouraging to meet a group of enthusiastic geology pupils, with their teacher, from Calday Grange Grammar School in the Wirral (Fig. 2).

We were introduced to the complexities of the restoration with a laser generated fly-through video. Because of the poor state of the buildings (some were held up only by the strength of the roof) they were too dangerous for surveyors to enter. This was quite remarkable and emphasised the care and skill needed by all those involved in the works to bring the project to a safe conclusion. It is the first restoration project in the country to adopt this technique.

We were split into two groups for a guided tour of the site. The exhibits cover the social as well as the working aspects of the 'open-pan' method of salt production; you pass through the Red Lion pub that was built on site for the workers. Every effort has been made to re-create the 'humid working atmosphere' in

Fig. 3 Collecting salt from the open pan

the sweltering rooms where the brine was boiled in open, iron pans. The salt was scraped to the sides to be collected and put into wooden containers to be dried (Fig. 3).

There are exhibits of the drying, cutting and grinding the salt blocks. Hands-on demonstrations of crystallising salt as well as models and sections showing the geology of the strata comprising the salt beds.

A major part of the museum is devoted to the disastrous effect that wild-brine pumping had on ground stability and the resulting impact on houses (Fig. 4), roads and the salt mines themselves. The 'flashes' are sunken areas filled with water where the land collapsed into the mines. It concludes with the positive outcome of the new habitats and nature reserves that have been reclaimed from what was once an industrial wasteland (Fig. 5).

An interesting two minute aerial film of the Lion Salt Works is available at: https://vimeo.com/132320192 (This link is free to download and to embed on websites, courtesy of M7Aerial and Marley Eternit).

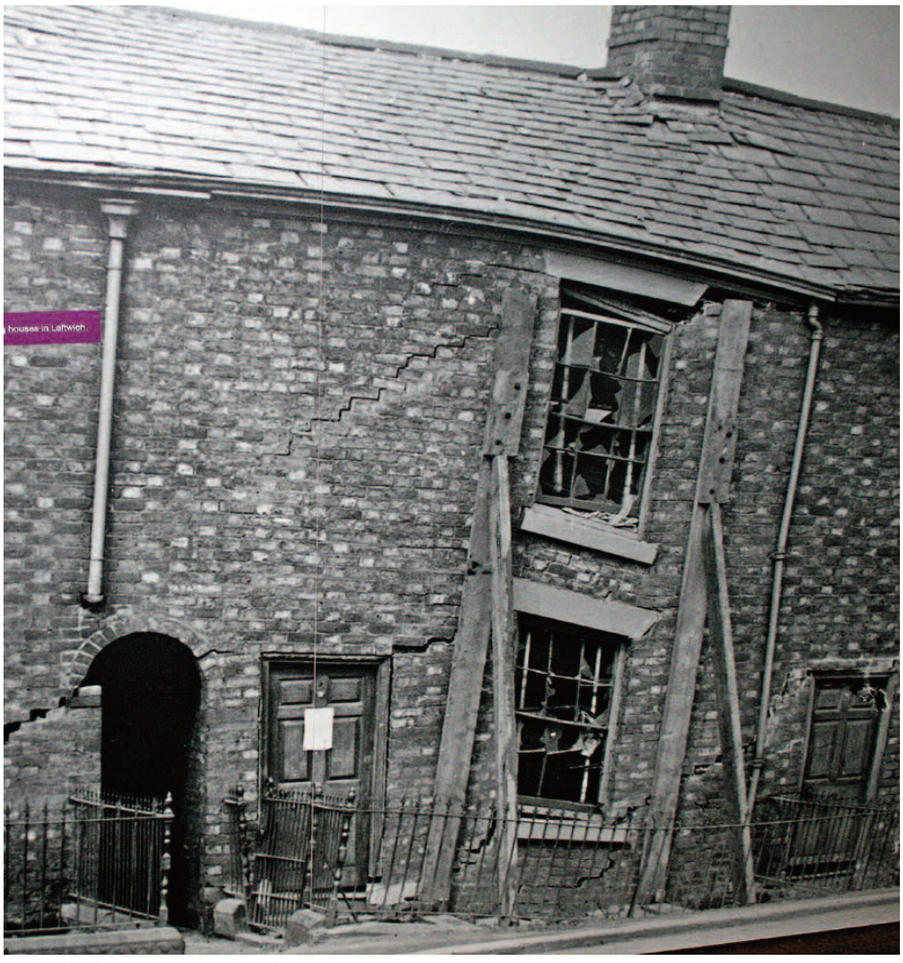

Fig. 4 One result of salt subsidence

Fig. 5 One of the ‘flashes’ now a nature reserve from reclaimed industrial wasteland ©F Owen

The museum is an impressive reconstruction and representation of the original ‘open-pan’ method of salt production. It brings home what an important raw material salt has been, and still is, in everyday life. In conversation with Prof Christopher Jackson of Imperial College, (a former Manchester SEAS student) who now specialises in salt tectonics, remarked that ‘salt comprises just 1–2% of the sedimentary succession, but forms the seal for all the major oil and gas reservoirs in the world’. Without doubt you will find a visit full of interest and wonderment at the toils and tribulations that were endured to bring us that essential additive to our diet, especially our fish and chips!

Continuing the heritage of salt theme, there is another Cheshire initiative called ‘Saltscape’. It is a new partnership to protect, enhance and celebrate the unique landscape of the Weaver Valley by connecting heritage, nature and people to the legacy of Salt. It has funding of £1.4m from the Heritage Lottery Fund, spread over three years, to achieve its aims. One of the partners is Cheshire RIGGS involving Prof Cynthia Burek, of the University of Chester. I have become involved as a committee member of the Northwich and District Heritage Society and have agreed to lead a geology walk round Frodsham for Saltscape in May next year. Further details can be found at www.saltscape.co.uk, where the full 2016 programme of events will be published shortly.

References:

1. Hewitson, Chris, 2015, *The Open Pan. The Archaeology and History of the Lion Salt Works.* West Cheshire Museums. ISBN 978-0-9932835-0-5
2. Press release after the event 'Rock' stars pronounce Lion Salt Works Museum a success: *‘Lion Salt Works Museum Meets ‘Rock’ Stars’* issued by Marketing Cheshire, can be seen on the MGA website at mangeolassoc.org.uk

[Figs 3 and 4 are old photographs. Editor]

Joint MGA/Lancashire trip to Wirral

Leader: Hilary Davies
Sunday 28 June 2015
Report by Penny Heyworth

The purpose of this day was to examine the outcrops of rock on the Wirral Peninsula and learn about the Triassic Period. The Triassic lasted about 50 million years, from 250 to 200 million years ago, when Britain lay at the heart of the single, giant continent of Pangaea at 10 –20° north of the equator.

The climate was initially hot and dry. There was no water or vegetation to bind the sediments so it was easily blown about by wind. There were, however, occasional flash floods that moved huge amounts of sediment. To the south of Britain was a range of mountains that were the source of much of the sediment. With time the Triassic climate became less arid; there are preserved footprints of a small dinosaur-like animal in the damper sediment. Recent microscopic research has identified fragments of plant material, but none has been preserved on a large scale. Subsequent earth movements and the erosion of overlying marine sediments have exposed the Triassic sediments on the Wirral which is now a “saddle” with the youngest rocks in the middle.

The last retreat of glacial ice from the Wirral around 15,000 years ago left glacial till filling the low points in the landscape. Post glacially the Wirral has been modified by rivers and the sea. There is an ancient forest encased in peat, which has been covered and hidden by the belt of migrating sand-hills; until recently backed by lagoons.

Grange Hill (Helsby Standstone)
Opposite the Broken Heart in Abbey Lodge, we examined the texture, grain size and shape of the sandstones. The sandstone is very mottled from red to almost white. The sand grains are well rounded, typical of sand grains blown a long distance by the wind. The grains are coated with haematite. Cross bedding can be seen. The better cemented sandstone is black with pollution; in the softer sandstone there are bee holes.

Red Rocks, Hoylake (Chester Pebble Beds)
There are two types of pebbles. One is a very distinctive, hard, well rounded, pale quartzite. Its source is the mountain range to the south in what is now Brittany. The pebble size becomes progressively smaller with distance from the source; this is their northern limit. The other pebble type is of dark red mud with a rim of sand grains enclosing the mud, known as an “armoured mud ball”. The mud accumulated in a braided river, back water environment, was baked in a hot climate and then transported a short distance by water. Small scale cross bedding can be seen.

Thurstaston Common
As the name suggests this is the heart of Viking Wirral. From the top of Thurstaston Common there is a panoramic view of the Wirral. The high ground of Thursaston Common is sandstone forming poor farming land. Compare this with the good farming land, of the Cheshire Plain, on the drift which is intensively cultivated. Cheshire cheese is based on milk from cattle grazed on the rich pasture of the glacial deposits. The bed rocks are 15m below the River Dee and dip towards Chester. Ice came down the Irish Sea and was deflected by the Snowdon ice cap inland along what is now the Dee towards the Cheshire Plain. Consequently the River Dee valley is “too wide” for its present day river so is silting up.

Thor’s Stone
There are differing interpretations for the origin of Thor’s Stone. Did the glaciers wear away the surrounding rocks, but not Thor’s Stone? Is it residue from quarrying? It seems likely that Thor’s Stone supported the crane used in the quarrying of the surrounding hard sandstone; utilised for local building stone. And what is the origin of the narrow channels or troughs running down the stone? Has the Stone been scoured by water flows under the ice? Or are they as a result of generations of children sliding down the slope and wearing these feet sized channels? Victorian postcards show Thor’s Stone without the channels, so is the probable explanation.

Road Cutting near the Thursaston Common carpark

This is a long exposure of a significant section of the Triassic sandstones. The lower part is the Wilmslow Sandstone Formation, the Thursaston Hard Member is below, and the Thurstaston Soft Member above. The different layers are picked out on the basis of their relative hardness (Fig.1a and b). The Hard Member is resistant to erosion and has been blackened by pollution. The Soft Member erodes faster and so remains fresh in colour. Both members have very similar grain size and shape as the sand grains at Grange Hill. The cement of the Hard Member is what makes the difference.

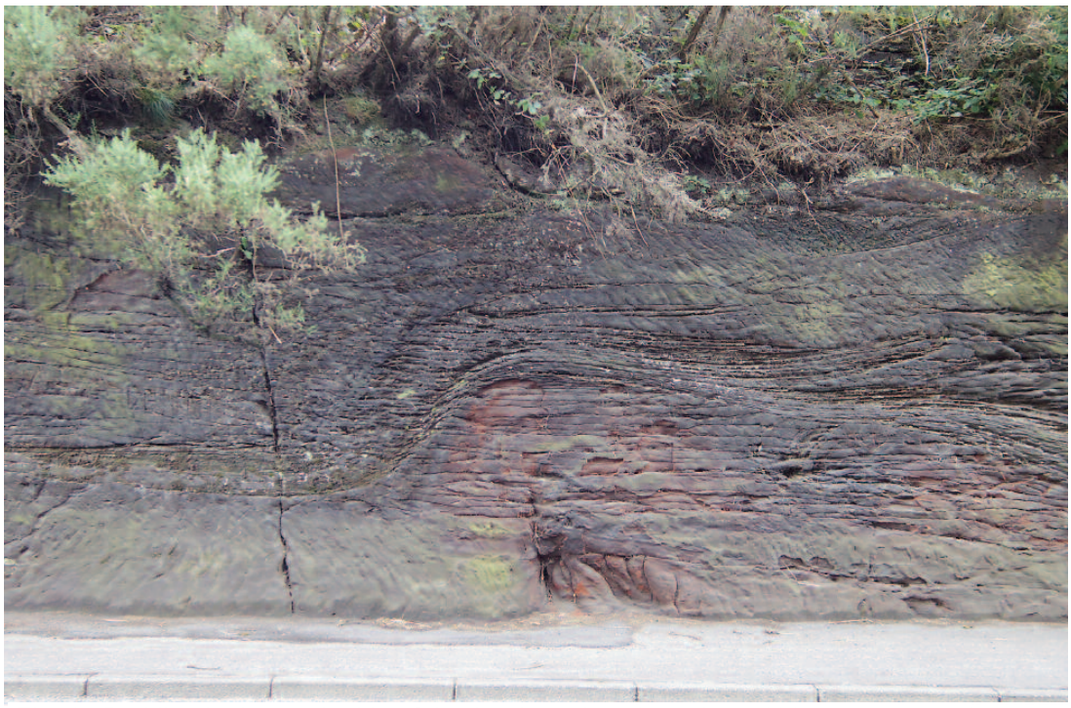

Fig. 1a Bedding in the north side of the A540 road cutting, about 130 metres towards Caldy from the entrance to Thurstaston Common Nature Reserve car park.

A fault plane at this location is picked out by several finely spaced offset creamy white bands (Fig. 2) in the lower part of the cutting. The fault plane is also creamy white. Faults in rocks tend to act as focal points for the penetration of groundwater which washes out the red, iron-rich staining in the rock.

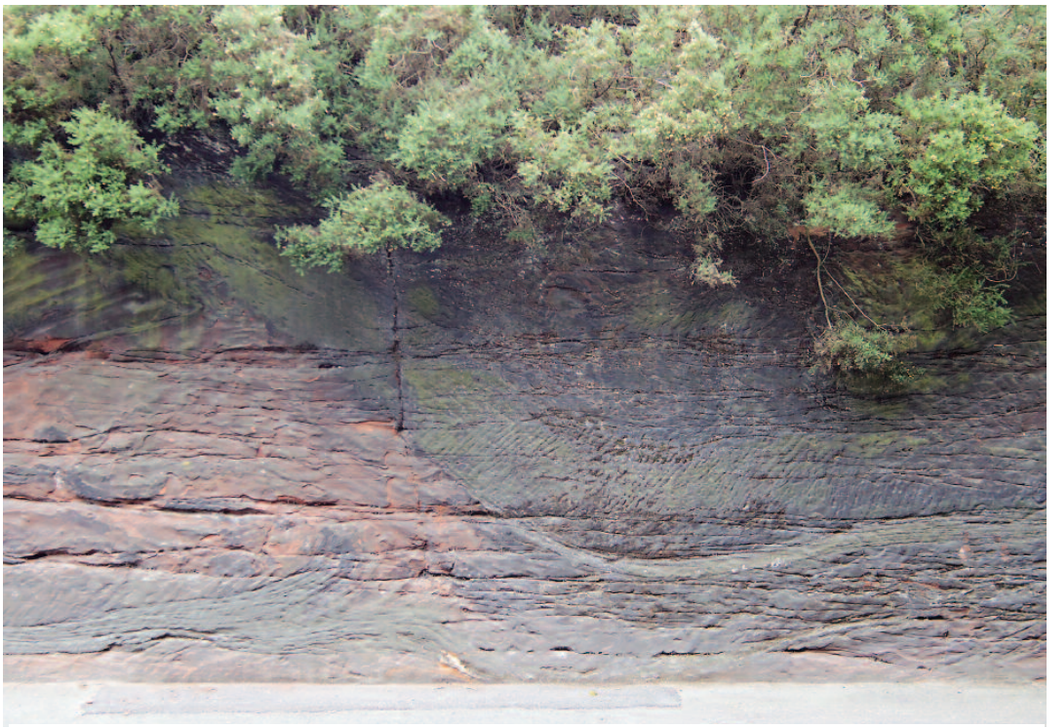

Fig. 1b The Hard Member is resistant to erosion and has been blackened by pollution.

Fig. 2 Fault plane marked by the off-set creamy white bands. The fault has acted as a focal point for the penetration of groundwater which washes out the red, iron-rich stain in the rock.

Thurstaston Beach

The cliffs here provide what has been described as the best display of the composition of the Irish Sea glacial till. This is because the cliffs are occasionally undercut by the sea causing them to stay vertical and dry and therefore free of vegetation.

The pebbles in the cliffs and on the beach are from different sources; transported here by the ice from the bed of the Irish Sea, the Lake District and southern Scotland. The till also contains fragments of seashells and gypsum.

There are a number of very large, rounded boulders of a variety of rock types on the beach. One explanation for them is that they were brought here as ballast in sailing ships that beached at the base of an old lime kiln. Once the ships were loaded up, the ballast was no longer required, so was discarded.

Our thanks to Hilary for a very interesting day and excellent handout. Information provided by Hilary Davies has formed the basis of this report.
Photographs by Peter Giles.

Other Societies and Events

University of Liverpool
The Annual Herdman Symposium
Geoscience Frontiers
27th February 2016

Dr Andy Biggin (Liverpool) – Deep Earth Geophysics and the origin of the inner Core.
Dr Steve Brusatte (Edinburgh) – Why did the Dinosaurs go extinct? New insights into an age-old mystery.
Prof Chris Jackson (Imperial) – Terra Infirma; what is Salt and why should we care?
Dr Sue Mahony (Bristol) – Core Blimey! What drilling holes in Ocean floors can tell us about Volcanoes.
Prof Frances Wall (Exeter) – Rare Earth Ore Deposits – Carbonatites, Clays and Critical Minerals
Dr Bob Ward (LSE) – Communicating Climate Change.

to book for this event go to:
http://payments.liv.ac.uk/browse/extra_info.asp?compid=1&modid=2&catid=38&prodid=1325
Cost £10 including refreshments.

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

18 January, 7:30 Gondwanaland, the Southern Supercontinent
30 January, 10:00 Geoconservation Day - Sedgley Beacon
15 February, 7:30 The Debitage Dilemma - the Distribution of the Lithologies at Stonehenge
20 February, 10:00 Geoconservation Day - Saltwells Nature Reserve
12 March, 10:30 Geoconservation Day - Barr Beacon, Pinfold Quarry

Liverpool Geological Association
http://liverpoolgeologicalsociety.org/

19th Feb: Footprints and sedimentology of the Formby coast (T.B.C.) (Professor Silvia Gonzalez)
20th Feb: Field meeting to Formby (Professor Silvia Gonzalez)
25th Feb: Joint Meeting with the NW Group of the Geological Society Formby Oil Field and Bowland Basin (Professor Richard Worden)
27th Feb: Herdman Symposium - Geoscience Frontiers 2016
8th Mar: Annual Dinner, Villa Romana
9th Apr: Field meeting, Derbyshire (Joe Crossley)
12th or 19th Apr: Lecture (T.B.C.)
7th May: Field meeting (T.B.C.)
21st & 22nd May: North Wales Field Meeting (T.B.C)

OUGS NW Branch Events
www.ougs.org/northwest

Saturday Feb 6th: NW Branch AGM and Dinner at The Pines Hotel, Clayton-le-Woods, Chorley, PR6 7ED. Free tea/coffee from 6pm, AGM at 6.30pm followed by Dinner at 8pm. Contact: John Gooch: jk.gooch@sky.com
Sunday Feb 28th: Beginner's Field Trip near Oldham with Chris Arkwright (ex-OU tutor). Contact: Pam Norris pamandnodge@btinternet.com
Saturday March 19th: Day Trip in the Bowland Basin near Airton, N Yorks with Paul Kabrna Contact: Stephen Darlington Stephen.darlington1@btinternet.com

Sunday April 3rd: Field trip around New Mills, near Stockport: Geology and Industrial Archaeology around Torrs Gorge at New Mills with Derek Brumhead (MGA). Contact: Martin Elsworth webmaster@ougsnw.org.uk
May 22nd – 27th: Four Day Field Trip to East Lothian with Fiona McGibbon (OU tutor). This trip is fully booked, waiting list only. Contact Jane Schollick JANESCHOL@aol.com
July 8th - 11th: OUGS Symposium at Exeter University.
Saturday 30th July: Ingleton Waterfalls Walk with Hilary Davies (OU tutor) Contact: Pam Norris pamandnodge@btinternet.com
September 16th –19th: Long Weekend looking at the geology of Shropshire with Dave Green. Contact Jane Schollick JANESCHOL@aol.com
Early October: Liverpool city Rocks and Building Stones: Self led trip using LGS guide 'Rock around Liverpool'. Contact Jane Schollick JANESCHOL@aol.com

Russell Society (Mineralogy)
http://russellsoc.org/events/

January 2016.
Friday 8th NW Branch AGM & "Show and Tell" event. Meet at the Critchleys' house in Blackrod at 20:00. Harry Critchley (NW) 01204 694345.
Sunday 10th W&W Branch Museum Workshop. Talk on "Copper in Wales" by Tom Cotterell. Meet at National Museum of Wales, Cardiff. Details from the organiser. Tom Cotterell (W&W)029 20573361 or 07964 143773.
Thursday 14thS Branch AGM and short talks. Details to be advised.Contact Branch Secretary for further details.Marco Petrovich (S)07914 210328
Friday 15th C Branch AGM followed by a talk. Topic to be confirmed.
Meet at 20:00 in the Education Room, Charnwood Museum, Queens Hall, Granby Street, Loughborough, LE11 3DU. Neil Hubbard (C) 01509 414427.
February 2016.
Tuesday 2nd SW Branch Meeting. Programme to be confirmed. Meet at Indian Queens Working Mens Club at 19:30. Jeremy Hooper (SW) 01726 851464 or Tony Lee (SW) 01208 873584.
Sunday 7th W&W Branch Museum Workshop. Talk on "Silver in Wales" by Tom Cotterell. Meet at National Museum of Wales, Cardiff. Details from the organiser. Tom Cotterell (W&W) 029 20573361 or 07964 143773.
Thursday 11th S Branch meeting. Programme to be advised. Contact Branch Secretary for further details. Marco Petrovich (S) 07914 210328
Friday 12th NW Branch Meeting. Programme to be confirmed. Meet at the Critchleys' house in Blackrod at 20:00. Harry Critchley (NW) 01204 694345.
Friday 19th C Branch Meeting & Talk "The British Geological survey: Modern collections with a long history" by Mike Howe, Chief Curator, BGS. Meet at 20:00 in the Education Room, Charnwood Museum, Queens Hall, Granby Street, Loughborough, LE11 3DU. Neil Hubbard (C) 01509 414427.
March 2016.
Tuesday 1st SW Branch AGM including buffet & mineral auction. Meet at Indian Queens Working Mens Club at 19:30. Jeremy Hooper (SW) 01726 851464 or Tony Lee (SW) 01208 873584.
Thursday 10th S Branch meeting. Programme to be advised.Contact Branch Secretary for further details. Marco Petrovich (S) 07914 210328
Friday 11th NW Branch Meeting & talk "Rare earth elements & their minerals" by Michael Doel. Meet at the Critchleys' house in Blackrod at 20:00. Harry Critchley (NW) 01204 694345.
Sunday 13th W&W Branch Museum Workshop. Talk on "Gold in Wales" by Tom Cotterell. Meet at National Museum of Wales, Cardiff. Details from the organiser. Tom Cotterell (W&W) 029 20573361 or 07964 143773.

Membership fees are due on 1st January

Current membership fees are:

Full member, correspondence by email £16.00

Full member, correspondence by post £18.00

Full member and an associate member, correspondence by email £18.00

Full member and an associate member, correspondence by post £20.00

An associate member is an adult residing at the same address as a full member.
If you want to change your type of membership please contact Niall Clarke to make the necessary arrangements.

Please make **cheques payable to Manchester Geological Association** then send with your address and email address to the Treasurer, Niall Clarke, at 64 Yorkdale, Oldham, Gtr Manchester, OL4 3AR.

STANDING ORDER FORM

To……. Bank …….
Branch .....

Please pay to account number 91055733 of the Manchester Geological Association at Nat West Bank plc. Heald Green Branch, 206 Finney Lane, Cheadle, SK8 3QF
Sort code 01-03-90.
£ …….. on……..… (date of first payment)
and on 01 January each year thereafter until further notice.
Reference (your Surname and Initials) ……

Signed……. Date…….

Account to be debited: A/c no ……
A/c holder(s): ……
……

*This is a new instruction
*Please cancel any previous standing order to the Manchester Geological Association under the above reference.
*please delete as appropriate
Please ensure you have inserted the date of first payment on your application form, then send this Standing Order form to your bank not to us.

The MGA is registered as a charity (Charity No. 500532), so any member who is a taxpayer can add to the funds at no cost to themselves by filling in a Gift Aid form. Please print out the Gift Aid form on the web site; complete fully and return to the address thereon.