



# Manchester Geological Association

President: Jane Michael

December 2016 Founded 1925

[www.mangeolassoc.org.uk](http://www.mangeolassoc.org.uk)

**WISHING ALL OUR MEMBERS A MERRY CHRISTMAS AND A  
HAPPY NEW YEAR**



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## Joint Meeting with the Manchester Geographical Association

At our joint meeting will be held on the **8 March** on the Brooks Campus; **Prof. Iain Stewart** will be speaking about ***Faulty Communications: Seismic Hazard in Istanbul***. The talk starts at 6.30pm. Please note that seats are not bookable. Attendance at the meeting is expected to be high, due to Iain Stewart's reputation and TV appearances, we suggest that you get there early to ensure you get a good seat in the lecture theatre (it holds 300). There is an on-site cafe which is open until 8pm, according to the MMU website, serving light snacks and hot drinks. For information about finding the venue please visit MMU website <http://www2.mmu.ac.uk/travel/manchester/>

## **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

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](mailto:president@mangeolassoc.org.uk)

To contact our Vice-President: [vicepresident@mangeolassoc.org.uk](mailto:vicepresident@mangeolassoc.org.uk)

To contact our General Secretary: [secretary@mangeolassoc.org.uk](mailto:secretary@mangeolassoc.org.uk)

For membership enquiries: [membership@mangeolassoc.org.uk](mailto:membership@mangeolassoc.org.uk)

For field visit enquiries: [outdoors@mangeolassoc.org.uk](mailto:outdoors@mangeolassoc.org.uk)

For indoor meeting enquiries: [lectures@mangeolassoc.org.uk](mailto:lectures@mangeolassoc.org.uk)

For newsletter correspondence: [newsletter@mangeolassoc.org.uk](mailto:newsletter@mangeolassoc.org.uk)

For other enquiries: [info@mangeolassoc.org.uk](mailto:info@mangeolassoc.org.uk)

## Field Trips for 2017

Penny is busy organising a variety of field trips for the coming year. So far there are two events.

**1st April.** RIGS trip with Christine Arkwright.

**5th Aug.** This is one of the Rocky Ramble series which will be led by Jane to the Roaches.

### In the pipe line:

North Staffordshire with Eileen Fraser

The Kettle Hole at Rostherne. This is at a nature reserve, so has to be early in the year before the birds start nesting.

A possible trip to the Buxton area with Paul Aplin.

## MGA GCSE Geology Prize

This year (2016) the MGA GCSE Geology Prize winner, at Altrincham Grammar School for Boys, is William Ridge. He obtained the remarkable score of 197/200 at GCSE – the second best result in the country. In sixth form he will continue to study Geology along with Further Maths, Chemistry and Physics with intention of a following a career in Engineering.

## LION SALT WORKS MUSEUM HOSTS PRESTIGIOUS VISIT FROM KOREAN MUSEUM ON A FACT-FINDING MISSION ABOUT SALT

On Tuesday 8 September, the Lion Salt Works Museum welcomed a research team, of Korean representatives, from the prestigious National Folk Museum of Korea; based in Seoul. The purpose of their five-man visit was to gather information for an exhibition called 'Salt of the World'. As the Lion Salt Works Museum is one of the last four open-pan, salt-making sites in the world, a visit to the site was a high priority for the team.

Ms. Hye-Roung Park, Curator of the Exhibition Division of the National Folk Museum of Korea, said: "We are enormously grateful for the time and effort that the Lion Salt Works Museum has taken in showing us around. Visiting the Museum, looking at its exhibits and hearing about the history of salt in Cheshire, the impact it had on the region and globally was truly fascinating. It was so different from what happens in our country." Salt in Korea is traditionally made from either boiling or evaporating sea water.

"But there are similarities too. We were interested to learn that you throw a pinch of salt over your shoulder for good luck. In Korea we believe we ward off misfortune by sprinkling salt at our gate."

Councillor Louise Gittins, Cabinet Member for Communities and Wellbeing at Cheshire West and Chester Council, said: "Salt is one of the things that defines Cheshire and we are delighted to be spreading the word about the global significance of Cheshire salt to an international audience. As a result of the Korean exhibition on salt, we very much hope that we will get visits from Korean visitors and anyone else who is interested in hearing about the fascinating story of Cheshire salt."

Earlier this year, the Lion Salt Works Museum won one of the country's top awards, the Heritage Project 2016 Award from the National Lottery Awards, following a public vote. The winner of six other awards since opening in 2015; the Museum tells the story of salt and its importance regionally and globally. The Museum, one of the last open-pan salt-making sites in the world, is an Ancient Scheduled Monument.

For further information, contact:

Fiona Young, Marketing Cheshire, 01244 851867. [westcheshiremuseums.co.uk](http://westcheshiremuseums.co.uk)

# MGA Field Trip to Mam Tor

Leader: Cathy Hollis

20.07.2016

by Penny Heyworth

On a hot and sunny day a group of ten MGA members and guests visited key outcrops near Castleton. The late Viséan to Namurian succession of carbonates and clastics, together with the regional setting, offered an excellent opportunity to examine an exhumed hydrocarbon system, which is analogous to the East Midlands hydrocarbon province in Nottinghamshire and Lincolnshire. The excursion provided an opportunity to examine all elements of the hydrocarbon system. We discussed the source and migration of the metalliferous fluids responsible for the emplacement of Pb, Zn, F, Ba; Mississippi Valley-type (MVT) mineralisation on the Derbyshire Platform. The trip allowed examination of the source rocks for the fluids, reservoir and host rocks within the Lower Carboniferous limestones also examples of hydrocarbon and MVT mineralisation.

## Mam Tor (SK124 832)



Fig. 1 Mam Tor beds.

The Mam Tor beds are a series of stacked, basin-plain turbidites that record the first influx of coarse clastics into the basin. A variety of gravity flow related features are observed; from classic Bouma-type fining upwards beds to debrites. There has been considerable debate whether there are any stacking patterns in the succession that might indicate that they are part of a more ordered submarine fan system.

The Mam Tor outcrops afford the opportunity to examine the recent land slip (Fig. 2) that affect the old A625 road, which was closed in 1979. The highway surface provides a magnificent and durable 'time-surface' recording slip events over the past 30 years. The landslip as a whole has features within it that provide a good opportunity to examine a range of modern features which offer a visual analogue to subsurface extensional settings (listric faulting) and rollover antiform formation. Slippage tends to occur in the winter months when groundwater levels are high; owing to lack of plant evapotranspiration.

## Windy Knoll (Grid reference: SK124 829)

This former quarry comprises an exposure of Dinantian Limestone (Fig. 3), with a palaeokarstic surface, which is overlain with poorly exposed boulder beds. Bitumen is seen within fissures associated with the karst surface and in the limestone breccias; providing proof of a once-active petroleum system. At the top of the outcrop, less viscous, complex oil (including sticky 'elaterite') is seen seeping from within the soil.

Mam Tor outcrop allowed examination of the Edale Shale and the Mam Tor Beds (Fig. 1). The Edale Shales are early Namurian in age. The dark grey, organic rich and often highly fissile shales represent the basal mudstone unit that precedes the first influx of coarse clastic material into the basin – the Mam Tor beds. The Shales have a high TOC up to 5–10% in places and are analogous to the source rocks of the East Midlands oil fields and broadly equivalent to the Bowland Shale; potential Shale Gas reservoir in the NW. This makes the Edale Shale a source rock. Shell rich bands record death assemblages that show the link to open marine conditions to the South.



Fig. 2 The old, now closed, A625 road.



Fig. 3 Windy Knoll showing the Dinantian Limestone.

The bitumen is biodegraded, resulting in removal of n-alkanes, reduced proportions of aliphatic and aromatic hydrocarbons and enrichment in nitrogen, sulphur and oxygen compounds (Ewbank et al., 1995). The hydrocarbons are consistent with derivation from type II (marine planktonic) organic matter and high thermal maturity, most likely within the Edale Basin (Ewbank et al., 1995), where the Edale Shales reached a maximum burial depth of ~3km in the Late Carboniferous.



Fig. 4 Winnats Pass.

### Winnats Pass (Grid reference: SK135 826)

Winnats Pass offers the opportunity to traverse through the margins of an exhumed carbonate platform margin. The road follows the path of a palaeo-marine channel that dissected the platform margin and was further exploited by glacial melt-water in the Pleistocene. The architecture of the margin can be clearly seen with horizontal beds passing into basin-ward dipping beds that define the slope of the former platform. Small reef build-ups (mounds) can also be seen along the upper slope/platform edge. The group walked down the section and discussed the composition of the build-ups, the nature of the platform margin and its transition into the Edale Basin. The limestones are highly fossiliferous with abundant crinoids, green algae, corals (Lithostrotion, Dibunophyllum), brachiopods (Productus, Pugnax, Schizophoria) and occasional goniatites (Beyrichoceras), trilobites and bryozoa.



Fig. 5 Odins Rake; the old mine is hidden in the trees.

### Odins Rake (Grid reference: SK134 824)

Much of the mineralisation on the Derbyshire Platform is hosted within the faults and fractures that dissect the Lower Carboniferous (Dinantian) limestone. Odin's Rake (Fig. 5) is an E-W trending fault that hosts fluorite, calcite, galena, barite and quartz deposits; the group examined both the mineralisation in the walls of the fault and small samples.

Across the road is the crushing circle and mounds of waste material. Here the group had a very interesting discussion about the specialist plants that can survive in such environments.

Our thanks go to Cathy Hollis for an extremely interesting and thought provoking day and most of this report.

# Edale Valley Field Trip Report

By Brian Smith

The group gathered on a cool, but pleasant morning, in the Edale car park accompanied by a Wobble (the collective name for a group of cyclists) of cyclists and a multitude of walkers. When everyone had arrived Jane gave a short safety briefing, described the purpose of the day's trip and the route we were to take. She explained we would be looking at the form of the valley, the part the River Noe had to play in forming the valley, and the underlying geology.

The 8 km Edale valley is asymmetric, with the river Noe flowing on the south side. The geology of the area is Namurian (320–315Ma, a division of the Carboniferous period) and comprises alternating layers of weak shale and stronger sandstones on the upper slopes. To the north the upper levels are capped with Kinder Scout grit, which is displayed in the prominent tors that dot the skyline. Shale grit is represented by the bench features on the spurs that stand between valleys that incise the valley walls.

Jane explained that, despite the rounded shape, the valley was not formed by glaciers because the ice of the last maxima never reached here; the shape was due to deposition of periglacial deposits from higher up the slope sides. These deposits are termed 'head', a collection of fragmented bedrock caused by freeze/thaw effects at the edge of the glaciated area. Some of the rocks show a more shale-like consistency having come from the shale grit to the south. The valley floor comprises Edale Shale, a dark fissile mudstone.



Fig. 1 view of Mam Tor showing the short valleys.

The route took us up Jacobs Ladder; a laid pathway on route to Kinder Scout. From there we could see sphagnum peat up to 3m thick that was deposited 8000/6500 years BP. We could also see the tors on the ridges above us and, with the aid of binoculars, see the cross bedding.

With the briefing complete we set off following well defined footpaths and innumerable gates. At the first stop, where the path crosses the railway, Jane pointed out the difference between the two sides of

the valley. Towards Mam Tor (Fig.1) the valley side was incised by many short valleys up to 15m deep, whereas on the other side (Fig. 2) there were fewer but much larger valleys. She also pointed out the way the river followed a course closer to the Southern side of the valley. We also saw the lumpy topography due to numerous landslips.



Fig. 2 The view towards Kinder Low with the tors on the skyline. Note the fewer but longer valleys to the right.



Fig. 3 North side of the valley showing a slip feature and the outcrops of underlying shale.

We continued to follow the footpath and saw how the river had incised into the soft Edale Shale. The banks were much undercut making it too dangerous to get close. Where the underlying rocks were visible we noted the purple/grey colouration compared to the rocks of the valley sides. From here we could see the outcrops and sides of landslips on the northern valley side (Fig. 3).

Having passed the information hut we proceeded to the foot of Jacobs Ladder and began the climb up to the cairn. From here we had a spectacular view down the

valley (Fig. 4) that revealed the smooth sides and signs of landslips; a predominant feature of the landscape. From here we also had a good view on the tors on the skyline above us (Fig.5).

Having recovered from the climb we returned to the foot of Jacobs Ladder for a well-earned lunch. During lunch we discussed the landslip features and their possible causes. A section of hillside close to the bridge displayed a good example of the a



Fig. 4 View from the cairn towards Edal showing the valley shape.



Fig. 5 One of the Kinder Grit Tors.

slip (Fig. 6) and how the vegetation, in this case plants that thrive in wet conditions, could give a clue to the conditions beneath the surface.

With lunch over we returned along the same path as before, climbing the north side of the valley to Broadlee Bank Tor, where we examined an extensive landslip (Fig. 7). This is a large slip and indicates the extent of the land movement in the valley. Smaller slips, obvious by the exposed earth, showed how dynamic this landscape still is.

On our way back to Edale we examined the river that runs through the village. It was clear

how it had undercut the soft Edale Shale. On the banks we could see the orange colouration from the iron in the slate; the cobbles in the river bed having come from upstream.



Fig. 6 An example of a landslide showing the displaced materials heaped below the scar caused by the movement. The brown vegetation could indicate a stream that may have contributed to the slip.

As we walked back through the village to the car park Jane explained how some of the houses had sandstone tiles and others had slate. The latter only appeared when the railway was established so that they could be transported here.

At the end of the walk we all thanked Jane for her presentation and posed for a group picture (Fig. 8).



Fig. 7 The Broadlee Bank Tor slip. Note the extent of the area covered and the exposed earth indicating recent slips.



Fig. 8 The group picture.



# Broadhurst Lecture Day: Saturday 19 November 2016

Report by Jane Michael, President

Over 100 people, members and visitors, attended the Broadhurst Lecture Day, which was held in the Cordingley Lecture Theatre at Manchester University. The venue proved to be a good one with the catering at lunch time very generous!! I hope that everyone who attended agrees. We heard five very interesting and stimulating talks:

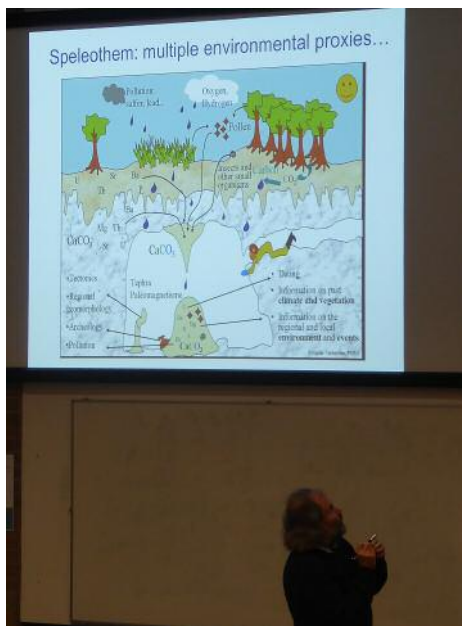
*The climate archives of caves and stalagmites* by Prof. Dave Matthey, Royal Holloway College, University of London

*Climate change, ecology and extinction* by Prof Richard Twitchett, Natural History Museum

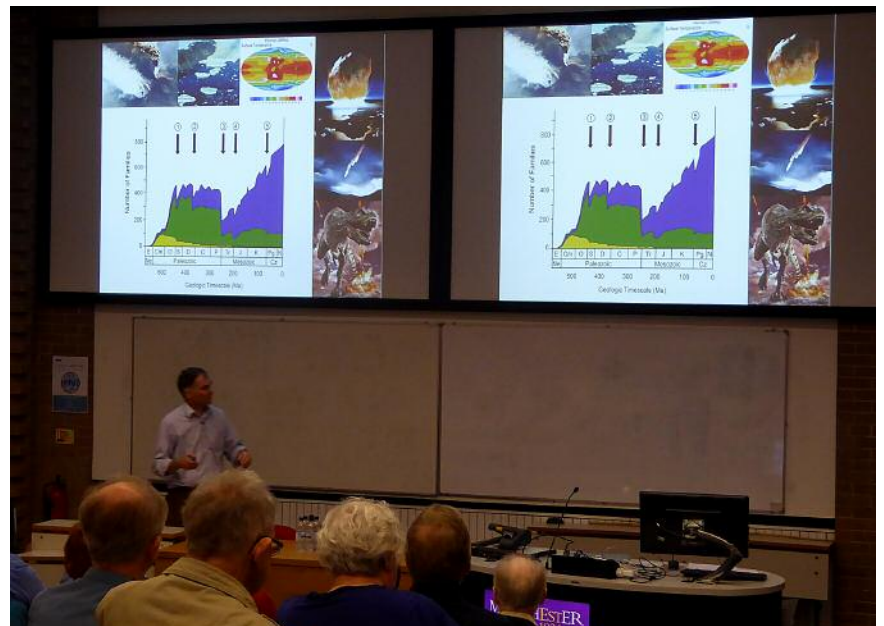
*Glaciers and climate change* by Prof. Mike Hambrey

*Ice Ages of early Earth* by Dr Catherine Rose, Trinity College Dublin

Modelling ancient earth climates by Prof. Alan Haywood, Leeds University



Prof. Dave Matthey,



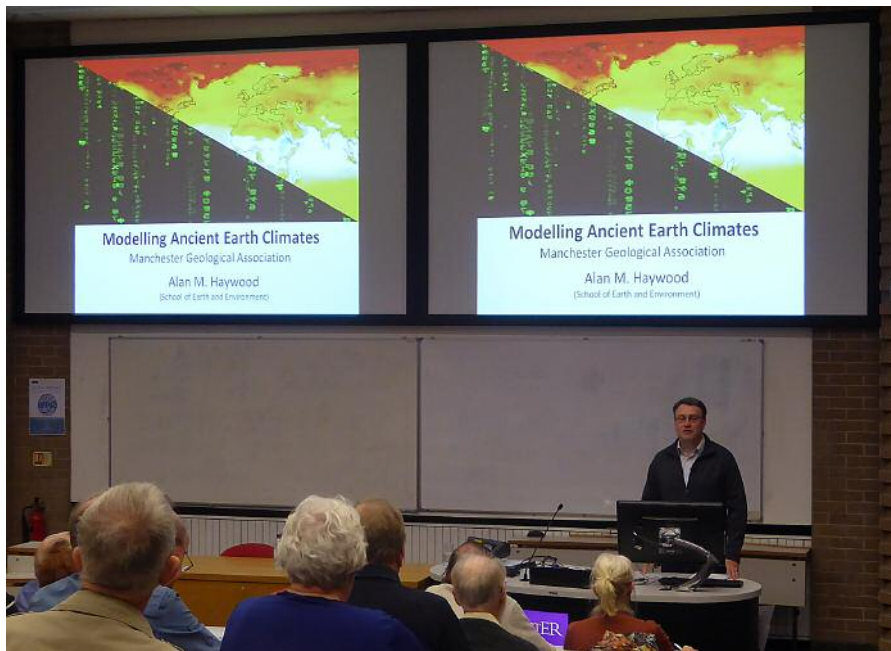
Prof Richard Twitchett



Prof. Mike Hambrey



Dr Catherine Rose



Prof. Alan Haywood

There were displays by GM RIGS, MGA, GeoLancashire and MENSA. Copies of the Manchester Building Stones guide were available to purchase.

I would like to thank the Council Members for their help in putting together the day. Niall Clarke produced a booklet including abstracts. If you did not attend but would like a PDF copy, please contact him (details on page 2). Next year the Broadhurst Lectures will be a half day event although the topic has not yet been finalised.

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## OTHER SOCIETY EVENTS

### Cumberland Geological Society

**Wednesday 25th January 2017.** Graphite in Borrowdale. Starts: 19:30

Location: Tullie House Museum & Art Gallery, Castle Street, Carlisle CA3 8TP

**Wednesday 22nd February 2017.** Geology and International Development: Interdisciplinary Work across Three Continents. Starts: 19:30.

Location: Friends' Meeting House, Kirkgate, Cockermouth, CA14 9PH

**Wednesday 22nd March 2017.** Relations on the Celtic Fringe. Starts: 19:30

Location: Friends' Meeting House, Kirkgate, Cockermouth, CA14 9PH

AGM & President's talk: Relations on the Celtic Fringe

### OUGS North West

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

**February 4th 2017 (Saturday)**

Event: North West Branch AGM, buffet lunch etc. Bolton Parish Church Hall.

12.30pm free buffet lunch, 1.30pm AGM, followed by members' photoshows.

**February 26th 2017 (Sunday)** Beginners Field Day around Park Bridge and Glodwick.

**March 19th 2017 (Sunday)** Looking in detail at Whitbarrow, a limestone hill. South Lake District.

**April 22nd 2017 (Saturday)** Geology of the Upper Goyt Valley and Shining Tor. Exploring sandstone and coal in the White Peak area of Derbyshire.

**May 2nd - 6th, 2017.** Isle of Wight Geology - 3 field days. Lead by Dr. Pete Webb (ex-BGS). Exploring the geology of the island - Lower Cretaceous (dinosaur remains), Lower Greensand, Chalk and Limestone.

**June 17th 2017 (Saturday)** Geology of the Wirral. Lead by Hilary Davies (ex-OU tutor).

### NWGA

Contact: <http://www.ampyx.org.uk/cdgc/rhaglen.html#agm15>

**Saturday January 21st 2017** AGM and Charting the History of the Yellowstone Super-volcano, USA

Speaker: Dr. Thomas Knott. 10am Meeting Room, Pencychnant, Conwy.

### North Staffordshire Group of the Geologists' Association

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

**Thursday 26th January 2017.** A Medical Geology perspective of the effect of soil on human health.

Dr Mark Cave (British Geological Survey)

**Thursday 9th February 2017.** Digital Geological Mapping. Leanne Hughes (BGS and Vice-President of the Geologists' Association)

**Thursday 9th March 2017** at 19:00 AGM & Geoengineering. Dr Ian Stimpson (Chair's Address)

**Thursday 30th March 2017.** Geological perspectives on the 'world's largest' conventional explosion at Fauld Mine, Staffordshire. Dr Noel Worley.

**The Black Country Geological Society**  
**bcgs.info**

**Monday 16 January 2017** Volcanics in Costa Rica. Speaker: Andy Harrison.

**Saturday 4 February** (Geoconservation Day): Rubery Cutting. In conjunction with the Lickey Hills Geo-Champions and directed by the Lickey Hills Rangers. Meet at 10.30.

**Saturday 18 February** (Geoconservation Day): Wren's Nest. Details TBC.

**Monday 20 February** (Indoor Meeting): 'The Wren's Nest - The Jewel in Dudley's Crown'. Speaker: Rob Broadbent, Friends of the Wren's Nest.

**Saturday 4 March** (Geoconservation Day): Portway Hill, Rowley. Meet at St. Brades Close at 10.30.

**Monday 20 March** (Indoor meeting, 7.00 for 7.30 start): AGM followed by 'New fossil reptiles from the Triassic of Tanzania: implications for the origins of dinosaurs and their kin'. Speaker: Richard Butler.

**Saturday 22 April** (Field Visit): Mortimer Forest, Hereford/Shropshire Border. Details TBC.

**Monday 24 April** (Indoor meeting): 'A Teacher's View of Glacial Geology'. Speaker: David Pannett (Shropshire Geological Society).

**Saturday 20 May** (Field Visit): Return to the Brymbo Fossil Forest, Wrexham. Details TBC.

**Saturday 17 June** (Field Visit): The newly refurbished Lapworth Museum. Details TBC.

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

**26 JAN.** Atmospheric and Societal Effects of Icelandic Volcanic Eruptions. Dr Anja Schmidt.

**23 FEB.** Presentations by Students of the School of Earth and Environment, Leeds University. Final Year Students; Earth and Environment University of Leeds.

**04 MAR.** (Saturday) Leading Yorkshire Figures in the History of Geology. Joint Meeting with Yorkshire Geological Society.

**23 MAR.** Yorkshire: a Land of Ice and Water in the Late Quaternary. Prof Mark Bateman, Sheffield University

**22 APR** (Saturday). The Geology of Your Shopping Basket. National Coal Mining Museum, Wakefield: Launch of Yorkshire Geology Month.

**27 APR.** The End-Triassic Mass Extinction: What Went Extinct and Why. Dr Alex Dunhil Leeds University.

**11 MAY.** Imaging Life on Earth. Prof Phil Manning Manchester University.

**12 OCT.** The Aberfan Disaster: Learning From the Past. Dr Helen Reeves. BGS.

**21 OCT** (Saturday). Cave Science Symposium. Joint Meeting with BCRA and YGS.

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

**07 DEC.** AGM and Conversazione – Short Talks and Displays by Members.

## Postscript to the Broadhurst Lectures

by Lyn Relph

Walking down Oxford Rd., on the way home after the Broadhurst Lectures, Christine Arkwright and I were discussing fossils and the conversation quickly turned to my particular interest – Carboniferous plant fossils. She was thinking that the day's lectures were about rather different fossils, but I said "not at all". The first beastie fossil found at Brymbo Fossil Forest was something that looked very like a trilobite! What in the Carboniferous? No it was an arthropod (see photo) belonging to the euproop group. After some research Christine emailed to say "most (trilobites) went extinct in the Devonian, there was apparently one order left during the Carboniferous before full extinction in the end Permian event." An interesting end to a very interesting day.



## INDOOR MEETINGS FOR 2017

**Saturday 21 January 2017** at 13:30. Rare Earth Elements: vital commodities  
Three speakers, including Prof Frances Wall (University of Exeter)

**Wednesday 8 February 2017 at 19:00**  
**Annual General Meeting and Presidential Address**

**Wednesday 8 March 2017** at 18:30 – Joint meeting with Manchester Geographical Association  
Faulty Communications: Seismic Hazard in Istanbul - Prof Iain Stewart, Plymouth University

The meeting will be held in the Manchester Metropolitan University Brooks Building, Bonsall Street, M15 6GX, Building 17 on the campus map. This is a 1 mile walk from Oxford Road station and about 0.5 miles from the car park used for the Broadhurst Lectures in November (map).

**Wednesday 29 March 2017** at 19:00  
Regionally Important Geological and Geomorphological Sites: assessment criteria and how they are selected - Dr Christine Arkwright

A field trip to a Greater Manchester RIGS will follow this lecture: date, time and location to be confirmed.

Unless otherwise stated, all lectures are in the Williamson Lecture Theatre, Manchester University, Oxford Road, Manchester.

## Membership 2017

### Membership subscriptions are due on Dec 31st.

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

I would be grateful if you could send subscriptions to me c/o 64 Yorkdale, Oldham, OL4 3AR. If any of your details have changed during the year, could you please let me know.

If you pay by direct debit you don't have to do anything unless you wish to change your membership type.

If you have any queries please email me at [niallclarke01@gmail.com](mailto:niallclarke01@gmail.com) or phone 07785 778250.

Thank you  
Niall

**Indus Experiences** run ecology and geology trips to the Himalayas. While the MGA does not promote or recommend commercial events the contacts details have been included as of possible interest to Members. Their web site <http://www.indus experiences.co.uk/special-interest/earthsciences>.