Manchester Geological Association

President: Prof. Cathy Hollis

September 2019

www.mangeolassoc.org.uk

Founded 1925

Geologists' Association GeoConference 2019

You will have seen the advert for the forthcoming GeoConference, which the MGA is co-ordinating on behalf of the Geologists' Association; it will be held from Friday 18th - Sunday 20th October 2019. There is a charge for the Saturday Day of Lectures of £40 for GA members and Affiliates of which MGA is one (ie the price MGA members pay is £40). Your Council has made a decision to subsidise MGA members attending the Saturday Lectures Day to the extent of £10 (ie you will pay £30 for the day - this DOES NOT include the Saturday evening Conference Dinner). For logistical reasons however, this £10 subsidy will be returned to members ON THE SATURDAY MORNING of the Conference when they register on arrival. This means you will need to book via the Geologists Association website https://geologistsassociation.org.uk/conferencebooking/ and pay the full price together with your Conference Dinner Fee and Field Trip fees if either are applicable. The £10 will be returned to you in cash. In order to assist us in planning (ie having sufficient £10 notes available!), please email indoors@mangeolassoc.org.uk or telephone to advise me that you have booked.

Quick Diary

Indoor Meetings 2019/20

Friday 18 – Sunday 20 October:	**Geologists' Association GeoConference.** Would MGA Members please register as soon as possible, particularly if you want to attend field trips.
Thursday 14 November 2019:	**Joint Meeting with Geological Society NW Branch: The Betec Cordilleras of SE Spain**
Saturday 23 November 2019:	**Broadhurst Memorial Lectures: The Anthropocene**
Saturday 7 December 2019:	**Geotourism**
Saturday 18 January 2020:	**Vertebrates: Cambrian to Mesozoic**
Wednesday 12 February 2020:	**Annual General Meeting and Presidential Address**
Tuesday 3 March 2020:	**Joint Meeting with Manchester Geographical Association (start 6.30pm)**

Who's Who in the MGA

Officers

President: Prof. Cathy Hollis

Vice-President: Niall Clarke MSc

General Secretary: Sue Plumb BSc

Membership Secretary: Niall Clarke MSc

Treasurer: Jennifer Rhodes BA

Indoor Meetings Secretary: Vacant

Field Excursions Secretary: Vacant

Newsletter Editor: Lyn Relph BSc (Hons)

Webmaster: Peter Giles MSc

Other elected members of Council
Prof. Ray Burgess
Nicola Fowler BSc (Hons)
Peter Gavagan BSc (Hons)
Penny Heyworth Mphil

Ex officio members of Council
The Immediate Past President, Manchester Geological Association: Jane Michael Bsc (Hons)

RIGS Representative: Dr Chris Arkwright

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: Dr 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

The Geologists' Association

Annual Conference 2019

Geological Resources in the North West - Past, Present & Future

at

University of Manchester and Manchester Museum

18th - 20th October, 2019

Provisional Outline Programme

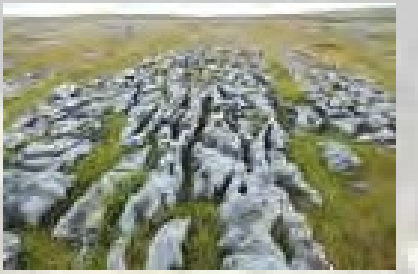
Friday 18th October

Arrival & Registration. Plus a visit to Manchester Museum's Minerals & Palaeontology section

Saturday 19th October Talks and Posters at Manchester University campus followed by evening Conference Dinner

Geology of the North West	Oliver Wakefield
Nuclear Waste Disposal, Wylfa Newydd: Ground Investigation	Rob Hunt
Brymbo Fossil Forest: Interface of Public & Palaeontology	Tim Astrop
Geothermal energy prospects of the Cheshire Basin	Catherine Hirst
Minerals of the Peak District	Roy Starkey
Hydrogeology of the North West	Vanessa Banks
Petroleum Geology of the North West	Mike Bowman
Exploitation of North West Salt resources	Andrew Fielding
Geoconservation in NW England: Saltscape HLF Project	Cynthia Burek

Sunday 20th October Field Trips



Building Stones of Manchester	Manchester GA, Jennifer Rhodes
Williamson Tunnels Tour	Liverpool Geol Soc, Philip Firth
Lower Carboniferous and Ribblesdale Cement Works, Clitheroe	GeoLancashire, Peter del Strother
Apedale Geotrail and Heritage Centre, with optional underground coal mine tour	North Staffs group of the GA, Ian Stimpson

For further information and registration:

Visit: www.geologistsassociation.org.uk or email: conference@geologistsassociation.org.uk

Registration opens 1st April, 2019

Hosted by the geological groups of Lancashire, Liverpool, Manchester, North Staffordshire & North Wales

GeoLancashire

CDGC / NWGA

MGA and GeoLancashire field excursion to Brymbo and Llay 27 June 2019

Leaders: Tim Astrop PhD, Brymbo Heritage Project
Jason Parry, Quarry Manager Hanson Cement
Report by Peter del Strother

Brymbo

At Brymbo are the *in situ* remains of a Duckmantian (Westphalian B, Pennsylvanian) 'forest', with fossil arborescent lycophyte and calamite stems in growth position. Stands of *Calamites* stems are said to be very rare, (Appleton et al. 2011). The exposures are a geological SSSI.

The site is associated with a historic iron ore processing complex which includes blast furnaces. The C19 steel works was connected to the mainline railway system and also to Minera limestone quarry, where limekilns produced quicklime for the blast furnaces. The remains of a Hoffmann kiln, of which there are only about three examples in the country, can be seen in the Minera quarry.

The Brymbo Heritage Project has secured funding from the Heritage Lottery Fund to create a visitor centre and to erect a building to cover the fossil plants, which weather rapidly as soon as they are exposed. Work on the building is expected to start soon. Currently visits are only by arrangement; for up to date information see their website (listed in bibliography below). A number of other projects are in hand, from growing traditional Welsh apple trees for cider-making to bee-keeping and nature conservation. An experimental bloomery is also planned, to smelt iron from siderite ore, as would have been carried out locally in the C12 and C13. Anyone with specialist knowledge or experience of operating bloomeries please get in touch. (Do we have any members that old?)

The party of twelve met at Brymbo in lovely weather, a good start to any field excursion! After a brief tour of the industrial archaeology we were led to an exposure of the Two Yard Coal, also known as the Hollin mine.

The most recent Brymbo blast furnace

Slag removal crucible from the modern steel works, now demolished.

Coal seam, 2m thick approx.

'Tree' *in situ*, diameter 0.7m approx.

The base of the exposure, which is located immediately above the unexposed Crank Coal, contained plant stems up to about half a metre in diameter preserved *in situ* mudstone. Stems over 1.5m diameter have been observed. Also seen were examples of *Calamites*, mostly in random orientations. Examples of *Stigmaria* were relatively common. Channels cutting through the mudstone were observed in a vertical face. The pair illustrated may represent the influx of coarse-grained sandy sediment splitting around a large lycophyte stem.

Calamites (~50mm diameter) and iron stained nodule.

Coarse grained sandstone filling channels in fine grained sandstone.

Between the 'tree' exposures and the coal was a horizon containing siderite nodules, the likely reason for the start of the local iron and steel industry. Siderite is iron carbonate, $FeCO_3$. Some siderite nodules contained preserved organic matter, especially rootlets. Iron stained nodules exhibited spheroidal weathering in the fine sandstones, possibly reflecting the processes of nodule formation.

Spheroidally weathered iron rich nodule, *in situ*, ~100m across.

Spheroidally weathered nodule (left), siderite nodule (right) (scale 5cm).

Part of the siderite nodule shown in the figure was analysed by Hanson Cement, Ribblesdale Works, using XRF on a fused bead. As received, the nodule contained, oxide analysis, 47% $Fe2O_3$. When heated to 1000°C, at which temperature the siderite has been calcined, the $Fe2O_3$ content was 65% dry basis, equivalent to 46% iron, which is certainly ore grade. The formation of siderite nodules is extremely complicated, but in normal circumstances they form only in non-marine environments. In reducing conditions in marine water, the activity of sulphate reducing bacteria leads to the production of pyrite. Meteoric water contains very much lower levels of sulphate than marine water and, when all the available sulphate has been used to form pyrite, bacterial activity leads to the production of siderite. In the English Westphalian siderite is quite commonly found associated with coal seams. In many places, such as Cliviger in east Lancashire, it was mined for use as iron ore.

Examples of enigmatic trace fossils, both in vertical and horizontal orientation, were seen in the fine-grained sandstones beneath the channel sandstones. A discussion followed on whether these were formed by roots or by burrowing organisms. The segments are not parallel with bedding. However, the bifurcating example has a morphology similar to a root. A small majority of those prepared to hazard an interpretation favoured roots, but the segmented morphology defied explanation.

Trace fossils in fine-grained sandstone

Thanks were expressed to Tim for his enthusiastic and informative explanation of the site.

Llay Main colliery slack heap

Most of the group continued to Llay. The coal mine tip is being reworked by Hanson Cement as raw material for cement production. It is located between Brymbo and Wrexham and is not publicly accessible. You can read something about the mine at http://www.welshcoalmines.co.uk/North/LlayMain.htm.

Figure 30 in the Flint Memoir is a log of the 750m deep No. 1 shaft. It shows the location of the aforementioned Hollin and Crank coals in the Westphalian succession.

Because the tip is being reworked there was plenty of coarse rock to be picked over. Abundant cobble sized fragments of coal were found, some extremely pyritic. Siderite nodules were also abundant, some with well-preserved plant matter. Fragments of sandstone exhibited ripple cross-bedding.

Siderite nodule with plant matter (lens cap ~50mm).

Below; Ripple bedded sandstone (vertical scale ~100mm)

Thanks were expressed to Jason for showing us around and explaining the use of the shale as a component of the raw material recipe for cement manufacture.

Bibliography:

Appleton et al. 2011. The Brymbo Fossil Forest. Geology Today, 27, p109–13.
BGS geological maps, 1:50,000, numbers 108 Flint and 121 Wrexham.
Brymbo website http://www.brymboheritage.co.uk
Curtis C.D. 1975. Mineralogy, chemistry, and origin of a concretionary siderite sheet (clay-iron-stone band) in the Westphalian of Yorkshire. Mineralogical Magazine, Vol. 40.
Davies J.R. et al. 2004. Geology of the country around Flint, BGS Memoir. (*This contains a log of Llay Main No. 1 shaft)*

Jura beige fossil identified

My piece in the June Newsletter resulted in one response from Tony North who wrote: “I'm pretty sure it's a sponge - see here: https://twitter.com/pavementgeology/status/731522639928426496.” Opening the link reveals a photo of a sponge very similar to mine, but nothing more specific. This supported Peter del Strother’s thought but he “was not sure”.

Pavement Geology on Twitter

“Sections through Jurassic sponges in Treuchtlingen Fm 'Jura Marble'; Pizza Express, Russia Row, London #UrbanGeology”witter.com

In the absence of any further replies I sent the image to an OUGS Mainland Europe friend, Mike Malloy, who has sent me a definitive identification of the beastie made by Dr. Guenter Viohl, curator of the Jura Museum in Eichstaett for 34 years. You will be interested to know that he identified it as follows: “ It is the cross-section through a beaker-shaped sponge, which are very typical for the 'Jura Marble' quarried in Kaldorf. Also visible in the darker areas are the crustal remains of bacteria which in turn, contain lighter coloured Tubyphites, which were sessile, colony building, Foraminifera.”

Fred Owen

N. A. S. A. & THE FIFTIETH ANNIVERSARY OF THE FIRST HUMAN MOON LANDING

Talk by Dr Green on SUNDAY, 9TH JUNE, 2019
A report by Charles Walker

As you would expect, Dr. Green, as the Director of the National Aeronautical and Space Administration, is a leading world expert on the Moon, but he, too, is being overtaken by events. Reported on the Internet today, the Chinese Space Mission has just photographed a "Ruined City" on the dark side of the Moon. (I learned all about this in the 1950's with Dan Dare and the Mekong in the "Eagle" Comic). Of considerably more interest Dr. Green predicts a large ocean of water a long way underground at its South Pole.

One intriguing revelation concerns meteoric analysis.

Retrieved from an earlier moon landing and brought back to earth is a meteoric fragment once embedded in the moon's surface, which may be the only surviving evidence for the early earth before the formation/presence of H_2O. It's a complicated story which concerns the moon as well. One theory is that the moon sheared off into orbit from the earth when the Earth collided with an early Planetesimal. (Not exactly a planet, you understand). The collision and the explosion was so vast that fragments of early earth were left attached to the moon. But there is so little of this early phase of the earth that scientific instruments can no longer find it or measure it. On the contrary, the moon fragment is pure and undefiled, uninterrupted by seismic activity as on earth.

Dr Green is preparing to send two astronauts to the moon in 2020: one male and one female.
The queue for his autograph was very long !

OTHER SOCIETY EVENTS

Yorkshire Geological Society http://www.yorksgeolsoc.org.uk/

Saturday 12th October 2019, 1.00pm to 4.30pm

ANCIENT AIR: THE EVOLUTION OF THE EARTH'S ATMOSPHERE, UNIVERSITY OF LEEDS

For further information about Yorkshire Geological Society events see
http://www.yorksgeolsoc.org.uk/

BCGS http://bcgs.info/pub/

5 October	Geoconservation Day: Saltwells LNR
21 October	A Geological Grand Tour of the Solar System
2 November	Geoconservation Day: Details TBC
16 November	An Introduction to Castle Hill
18 November	Talk tbc
7 December	Geoconservation Day: Barrow Hill (TBC)
16 December	Members' Evening and Christmas Social
18 January	Wren's Nest (TBC)
20 January	Jurassic Brain Teasers

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

04 – 06 October 19	Abberley and Malvern Hills Geopark
10 October 19	The Great Glen Fault Zone. Back and Forth Longer than we thought.
07 November 19	Does Size Really Matter? A Look at Aeolian Forms.

05 December 19 AGM and Conversazione. Short Talks and Displays by Members.

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

Fri 11 Oct	James Carter, Senior Engineering Geologist from Wardell Armstrong who has visited us before will talk on Iceland

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

October 27th 2019	Lancaster Building Stones
December 8th 2019	Afternoon of Lectures. Heald Green Village Hall Stockport, Manchester

Manchester Geological Association

Indoor Meetings 2019/20

Friday 18 – Sunday 20 October:	**Geologists Association GeoConference** 3pm tour of Manchester Museum with Prof Phil Manning 7pm meet at Abel Heywood pub, 38 Turner Street, Northern Quarter, Manchester, M4 1DZ Sunday 20th October Fieldtrips and Building Stones Tour. All fieldtrips will depart from outside the Manchester Museum on Oxford Road at 9am. The Building Stones tour will depart at 10 am from the Peterloo Monument Programme available on https://geologistsassociation.org.uk/conferences/
Thursday 14 November 2019:	**Joint Meeting with Geological Society NW Branch**: The Betec Cordilleras of SE Spain Speaker: Prof Ernie Rutter, University of Manchester Venue as normal but start time to come.
Saturday 23 November 2019:	**Broadhurst Memorial Lectures:** The Anthropocene Speakers: Dr Colin Waters, Leicester University Dr Colin Summerhayes, University of Cambridge Prof. Mark Williams, Leicester University
Saturday 7 December 2019:	**Geotourism** Speakers: Javier Carmona Carrillo Prof. Cynthia Burek, University of Chester Dave Cropp, Martley GeoVillage
Saturday 18 January 2020:	**Vertebrates: Cambrian to Mesozoic** Speakers: Prof. Rachel Wood, Edinburgh University(Provisional) Elsa Panciroli, Edinburgh University (Provisional) Dr Martin Brazeau, Imperial College, London
Wednesday 12 February 2020:	**Annual General Meeting and Presidential Address**
Tuesday 3 March 2020:	**Joint Meeting with Manchester Geographical Association** (start 6.30pm) The 2018 Sulawesi Earthquake and the Hazard Management in Indonesia Speaker: Professor David Petley, Sheffield University Venue: Manchester Metropolitan University, Brooks Building. Exact locations within the campus will be communicated to members nearer the time.

Bring Your Own Reusable Mugs

Would Members please bring a cup to use for tea/coffee when attending lectures, where refreshments are provided. It would be much appreciated. The MGA will be using biodegradable cups when our supply of polystyrene ones runs out, but these do cost more.