



**Circular 418
February 2016**

Registered Charity No: 503617

President: Vanessa Banks

www.emgs.org.uk

**WINTER/SPRING 2016
LECTURE PROGRAMME**

**PLEASE NOTE THAT THE ANNUAL DINNER FOR THIS YEAR IS
CANCELLED**

Saturday, 13th February 2016 – 6.00 pm
The annual presidential lecture
Vanessa Banks, BGS – Sinkholes and the media

Saturday, 19th March 2016 – 6.00 pm
AGM followed by
Rory Mortimore, Professor at Brighton University – Chalk of the Paris to London fast railway route

Saturday 9th April 2016 – Members Evening – 6.00 pm

CHANGE OF LECTURE VENUE

PLEASE NOTE Indoor meetings are now held in the School of Geography on the Nottingham University Campus which is in the Sir Clive Granger Building. Enter the University by the North Entrance, off the A52, and follow signs to the main Visitor Car Park. As you enter the car park, the Sir Clive Granger building is on your left and can be entered from the car park. **There are no parking charges for this car park at the weekend.** Lectures are held in Room A48

The Society is indebted to the School of Geography at the University, who are hosting our lectures, for the use of these facilities.

Saturday, 13th February 2016 – 6.00 pm

Sinkholes and the media – Vanessa Banks

The winter period from December 2013 to January 2014 was characterised by exceptional periods of winter rainfall in England and Wales. Extensive flooding and increased numbers of slope failures, landslides, and sinkholes, affected infrastructure across the country, thereby generating considerable media attention. In addition to government and stakeholder requirements, the BGS experienced an unusually high level of enquiries from the public and the media pertaining to “sinkholes”. This talk will describe the wave of incidents, the data that is held by the BGS and the processes associated with their formation.

Saturday, 19th March 2016 – 6.00 pm

ANNUAL GENERAL MEETING

A G E N D A

1. Apologies for absence;
2. Minutes of AGM held on 21st March 2015;
3. Matters Arising;
4. Secretary's Report;
5. Treasurer's Report;
6. Annual subscriptions;
7. Appointment of Auditor;
8. Editorial Report;
9. Election of Officers for 2016;
If there are no other nominations, it will be proposed from the chair that the following will serve:

President	- Vanessa Banks
Vice-President	- Brian Jones
Secretary	- Janet Slatter
Treasurer	- Colin Bagshaw
Editor	- Tony Waltham
10. Election of Council for 2016
Mike Allan, Keith Ambrose, David Bate and Tim Coleman..
There are 4 vacancies for Council, any nominations (after having obtained the consent of the nominee) should please be made to the Secretary
11. Vote of thanks to retiring Council members
12. Any Other Business.

The Minutes of the last AGM and the Treasurer's Report will be distributed at the meeting, followed by:

'Chalk of the Paris to London fast railway route' – Rory Mortimore

Collapse of part of the railway track along the TGV-Nord (Paris-Lille) in 1994 while a high speed train was running, causing the train to leave the track, led SNCF (French Railways), to commission ANTEA (Consultancy arm of BRGM, the French Geological Survey) to investigate the scale and extent of the problem. The initial results suggested that an undetected, unfilled cavity remaining from the First World War frontline was the cause of the collapse. However, following exceptionally heavy and intense rainfall in 2000 and 2001 'swarms' of ground collapse features were reported close to the railway line in regions north and south of the Somme valley where the Chalk was the main bedrock. The problem was bigger and more widespread than initially expected.

SNCF-ANTEA instigated an investigation that involved a complete re-assessment and remapping of the geology, the Great War battlefronts, climate data, records from farmers and the mayors of the local communities over a 150km long, 5km wide zone adjacent to the railway line between the valley of the Oise and Lille. Rory was appointed International Reviewer for the work and joined the SNCF/ANTEA team on field investigations.

In 2006 ground subsidence in and around the Canadian National Monument at Vimy Ridge, near Arras led to further investigations of the geology of the First World War battle fronts by a Canadian University team from Queens University, Ontario. Rory took the Canadian team into the field to train them on the Chalk before undertaking the work.

During the 1990s ground investigations for the Channel Tunnel Rail Link (CTRL/HS1) from Folkestone to London were undertaken by Union Railways Limited. These investigations provided the first opportunity to trial the CIRIA methods for classifying the engineering characteristics of the Chalk. The investigations provided the most comprehensive details of Chalk geology through the North Downs, under the Thames and into central London, a database subsequently used on all the major tunnels in London for Crossrail and the Thames Water tunnels. Rory was appointed consultant geologist to Union Railways for the Chalk part of the route.

Each of these construction projects has provided invaluable information on the geohazards related to chalk country that can now be applied to future projects such as HS2.

Saturday, 9th April 2016 – 6.00 pm.

Ongoing Research in the Peak District Lower Carboniferous

(1) Daniel J Myhill of University of East Anglia

Over the last decade a new geochemical tool, carbonate clumped isotope thermometry, has been developed (Eiler, 2007). This allows us to determine the precipitation temperature of carbonate minerals alongside their bulk isotopic composition ($\delta^{18}\text{O}$ and $\delta^{13}\text{C}$), to be able to deduce mineralising paleo-fluid $\delta^{18}\text{O}$ compositions. Applying this new tool in the South Pennine Orefield by measuring hydrothermal calcite set within the mineralisation's structural context, has allowed for mineralisation mechanisms of the fluorite-rich Pb-Zn ore deposits, hosted within the Lower Carboniferous Limestone, to be explored.

Constraints on the temperature of mineralisation and mineralising fluid compositions in the South Pennines indicate that mineralisation is associated with late Variscan brittle failure with high rates of episodic fluid flow and heat advection along fault surfaces, set within a well-defined two end-member fluid mixing process. This mixing process is seen to be between a warm basinal brine and a cooler meteoric fluid.

This talk will explore several localities within the South Pennines, including Dirtlow Rake near Castleton, as well as delving deeper in the enigmatic Ecton Mine copper deposits. This will hopefully highlight how clumped isotopes could aid our understanding of mineralisation mechanisms as well as showcasing the fascinating, often under-valued geology, on our doorstep in the South Pennines.

(2) Leah Nolan of University of Leicester

The Carboniferous represents one of the critical transitions in Earth's evolution when rapid changes in climate and atmospheric composition coincided with key events in evolution of life onto land. The late Paleozoic icehouse period is the longest-lived ice age of the Phanerozoic (Fielding et al., 2008) and is commonly cited as an analogue for the Quaternary, however resolving climatic changes over short (e.g., seasonal) time scales from the deep time records is challenging. This research project focuses on analyzing the stable isotope composition ($\delta^{18}\text{O}$, $\delta^{13}\text{C}$) of biogenic calcite to assess equatorial seawater temperatures and seasonality at a key point in Earth history: the time interval prior to the main phase of the late Paleozoic glaciation. How the phases prior to the onset of this known cooling event affected palaeoequatorial seawater temperatures and seasonality is unknown.

Stable isotopes ($\delta^{18}\text{O}$, $\delta^{13}\text{C}$) of biogenic calcite are frequently used for assessing palaeoenvironment and palaeoclimate. Here we use Mississippian gigantoproductoid brachiopods collected from the Peak District, UK sampled at high resolution (within individual growth lines) to assess seasonal variation within the organism's life-time. Brachiopods offer an ideal opportunity for examining short-term changes through isotopic studies because the shells of most species are composed of low magnesium calcite that is relatively resilient to diagenetic alteration when compared to other forms of calcium carbonate. Articulated brachiopods that lived in warm water are thought to precipitate their shell in isotopic equilibrium with ambient seawater (Brand et al.,

2013). However, preservation of primary calcite needs to be assessed prior to isotope studies to ensure that data generated reflects original seawater chemistry, rather than secondary diagenetic fluids. Preservation analysis encompasses a range of techniques, including scanning electron microscopy, cathodoluminescence microscopy, and analysis of trace element abundance (Mn, Fe, Sr, etc). Although it is best practice to use material that has passed most screening tests (Brand et al., 2011), this research also examines the criteria used to classifying biogenic calcite as pristine. Once pristine calcite is identified we can use stable isotope data from this calcite to calculate the sea surface temperature.

The isotope results from this ongoing project, coupled with a detailed sedimentological investigation will contribute to understanding seawater temperatures within palaeo-equatorial seas during the Mississippian. There are few well-constrained estimates of sea-water temperature derived from the UK succession and from these palaeo-equatorial latitudes will also contribute to debates regarding Palaeozoic tropical seawater temperatures that are considered by some authors to be warmer during interstadials (e.g. the Brigantian). This research will ultimately provide proxy data to improve estimates of the parameters required for data-climate model comparisons.

SUMMER 2016 **FIELD PROGRAMME**

Wednesday, 11th May 2016 – 2.00 pm

Leader: Richard Fawkes

This is a follow up after the excellent talk that Richard gave us at the Christmas lecture. Richard will demonstrate the fine techniques used in the preparation of museum quality fossil specimens and we will also be able to see a very wide selection of prepared specimens some of which are for sale.

Meeting place at 2pm is the Sherwood Forest Arts and Crafts Centre, Forest Corner, Edwinstowe NG21 9RN. From Nottingham take the A614 to Ollerton roundabout and turn left along the A6075 into the village of Edwinstowe where the centre is located near the junction with the B6034 (grid Ref : SK 626668)

Weekend, Saturday 21st May/Sunday 22nd May 2016 – The Llŷn Peninsula

Leader: David Bate

Meet on Saturday in parking area at Porth Ysgaden (SH 219 374) NW of Tudweiliog at 10.30 am.

On Saturday we will examine the Gwna Group melange, a giant submarine slide deposit magnificently exposed along the north coast of Llŷn. Previously thought to be late Precambrian in age, it now appears more likely to date from the late-Cambrian to early Ordovician – although there remains some controversy both as to the age and mode of formation of the melange. There is plenty of evidence of glacial (Devensian) activity along this stretch of coast, including cliff-sections and ice-moulded and striated rock surfaces. We will follow an established coastal path, with occasional descents to the beach, depending on the tide.

On Sunday we will explore the central upland area of the peninsula around Garn Fadryn, a sub-volcanic microgranitoid of mid-Ordovician age, along with its associated andesitic lavas. A visit to the summit (our first port of call) will provide an opportunity to examine the pre-Roman to medieval hill-fort settlement, including a fortress or 'stone castle' recorded as newly built in 1188 – though now visible to none but the initiated! The walk to the top of Garn Fadryn involves a 15-minute climb up a well-used zigzag pathway – but the view from the summit is simply unmissable! We will then retrace our steps to a col to look at a remarkable tourmalinite, and fossiliferous sediments of Longvillian age. Depending on time, it may be possible to visit the nearby Gledrydd gorge to

examine the hinge area of the Llŷn Syncline, which is not at all as shown on the published BGS Pwllheli sheet!

There will be occasions (mostly optional) for walking over loose rocks or uneven surfaces, so good footwear is advisable. It will probably be necessary to bring packed lunches on both days, but more information will be provided in the next Circular, once the Leader has had an opportunity to check out the logistics. Finishing time on Sunday is negotiable, and can be designed to allow people to depart mid to late afternoon.

Wednesday, 15th June 2016 – 7.00 pm Evening walk

Leader: Albert Benghiat
Buxton's Spring Waters

A leisurely 2 mile walk to view the geology, hydrology and natural springs of this spa town. (Full details in next Circular).

Wednesday, 29th June 2016 – 6.30 pm – Evening Walk

Leader: Keith Ambrose
The Shepshed Area

(Full details in the next circular)

Saturday, 23rd July, 2016

Leader: Jim Ridings
Day Trip to the Brassington Area

This is a joint field trip with the North Staffs Group of the GA (NSGGA) and is a repeat of the trip that Jim did for us last year. This gives any members who were unable to go last year another opportunity to visit this fascinating area.

(Full details in the next Circular).

September (Date to be finalised)

Leader: Colin Bagshaw

The Ashover Area

This is another joint field trip with the NSGGA. (Full details in the next Circular).

Our President Dr. Vanessa Banks has also offered to lead a field trip to investigate areas of mass movement on a large scale in Derbyshire Dales and full details will be in the next Circular.

SUBSCRIPTIONS

A reminder that these were due on 1st February

Subscription rates remain unchanged and are as follows:

Ordinary members - £18.00

Joint members - £22.00

Please send your subscriptions to the Treasurer as soon as possible and if you pay by standing order please ensure this is for the correct amount.

We are also trying to ensure that as many of our subscriptions as possible are gift aided. This costs you absolutely nothing but means that the Society will receive much needed extra funds by way of tax rebates, so if you haven't already completed a Gift Aid declaration, please contact the Treasurer and request one.

Society Publications

- (1) **East Midlands Field Guide;**
- (2) **Sandstone Caves of Nottingham** (3rd edition)
- (3) **Leicester Building Stones Guide**

Copies available by contacting the Secretary or at Indoor Meetings.

Mercian Geologist – Back numbers

Do you need any back numbers of the Mercian to fill a gap in your collection?

The scanning of every single issue of the Mercian Geologist that the Society has published is now complete. As soon as they are all accessible through the Society's website the stocks of back numbers that the Secretary currently holds will be disposed of although a complete set of hard copies will of course be kept for archive purposes. So please contact the Secretary Janet Slatter at secretary@emgs.org.uk or on 01509 843297 if you have any gaps that you want to fill

Information for Other Societies

We hold information of lectures and field meetings for other local societies such as the NSSGA, Black Country Geological Society and Leicester Lit & Phil Society. If you would like details of any of these, please contact the Secretary.

EMGS Website

The publications page on the Society website (www.emgs.org.uk) has been tidied up and updated. It now includes links to two archives:

One is the archive of the early Mercian Geologists where the huge task of diligently scanning and preparing copies of all the back issues has now been completed thanks to the hard work of David Bate. These will soon, if they are not already, all be accessible through the Society's website.

The other is the archive of papers and reports in the more recent issues. These will go into the webpage one year after they appear in the paper issues of the Mercian. All papers 2000 to 2014 are already in the online free archive.

Costs of the Circular

To minimise postal costs and photocopying charges which amount to approximately £4.00 each year for every member who still receives their Circular by post, we would very much like to send you your Circular by e-mail. If you have not already done so, please send your e-mail address to the Circular Editor, sue.miles@freeths.co.uk

Please can you also confirm your name and address when sending your e-mail so we can correlate these details with our membership listing.

The next Circular will be published in late March/early April 2016

The next Council Meeting will be held on 16th March 2016

Secretary: Mrs Janet Slatter, 100 Main Street, Long Whatton, Loughborough, Leicestershire LE12 5DG e-mail: janet.slatter@btinternet.com . tel. no. 01509 843297.

Treasurer: Mr Colin Bagshaw, 150 Scalpcliffe Road, Burton-on-Trent, Staffordshire DE15 9AD, e-mail: Colin.bagshaw@yahoo.co.uk tel. no. 01283 564520

EAST MIDLANDS GEOLOGICAL SOCIETY

BOOKING FORM - FIELD EXCURSIONS 2016

Please book me/us for the following excursions:

Wednesday, 11 th May	Sherwood Forest Arts & Crafts Centre
Weekend 21 st /22 nd May	The Llyn Peninsula
Wednesday, 15 th June	Evening walk – Buxton's Spring Waters
Wednesday, 29 th June	Evening walk – The Shepshed Area
Saturday, 23 rd July	Day excursion – Brassington Area
September	Day excursion – The Ashover Area

(Please delete those you will NOT be attending)

Name(s):

Address:

.....

Tel:

e-mail address:

I/we do/do not have a car available.

I/we would be prepared to offer transport.

Please send completed booking forms to the Field Secretary,
Ian Sutton, at 30 Alford Road, West Bridgford, Nottingham NG2 6GJ
Tel. No: 0115 923 2360 e-mail – ian.sutton035@btinternet.com
