



**Circular 421  
September 2016**

**Registered Charity No: 503617**

**President: Vanessa Banks**

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

## **SUMMER 2016** **FIELD PROGRAMME**

**Sunday, 11<sup>th</sup> September 2016 – The Ashover Area (Joint meeting with N. Staffs GS)**

**Leader: Colin Bagshaw**

**Time: 10.15 am**

**Meeting place: The car park by Ashover Village Hall (G.R. SK351633)**

The village of Ashover is situated within an inlier of Carboniferous rocks of Viséan and Namurian age outcropping along the valley of the River Amber. The numerous exposures contribute to the area being ideal to study the sedimentary sequence of limestone, shale and sandstones and pyroclastics typical of those found within the Peak District. Additionally the area has been folded, faulted and hydrothermally mineralised. Such a combination of events has provided the basis for a number of extraction industries in the past, including lead mining and the use of building stone.

The day will be spent studying the local geology via a series of short walks in and around the village. Stout footwear is advised. For lunch, pub refreshment and food will be available if required.

### **Insurance and Safety**

Members are reminded that the Society has only public liability insurance and that personal accident insurance is a matter for individual members to arrange as they consider necessary. Up to date hard hats are obligatory for all field excursions involving quarries or cliff faces and strongly recommended for all trips. High visibility clothing is sometimes required in working quarries. High visibility tabards can be obtained from GA Enterprises, 126 Fleetside, W. Molesey, Surrey KT8 2NQ at £4.70 incl. pp. Members without suitable hard hats may be refused access to certain sites! Hard hats can be obtained from many Builders' Merchants, Wickes, B&Q Warehouse etc. for about £4.

Any non-members attending field excursions will have to pay a temporary membership fee of £2.00 and all participants are reminded that they must comply with any instructions from excursion leaders or, for example, quarry managers or their employees on Health & Safety issues.

## **AUTUMN/WINTER 2016/2017** **LECTURE PROGRAMME**

**Saturday, 15<sup>th</sup> October 2016 – 6.00 pm**

**Noel Worley – Mineralisation of the South Pennine Orefield**

**Saturday, 12<sup>th</sup> November 2016 – 6.00 pm**

**Dr Nick Longrich, University of Bath – Giant marine reptiles & whales during the Eocene-Oligocene cooling event**

**Saturday, 10<sup>th</sup> December 2016 – 6.00 pm**

**Dr Tom Dijkstra, Loughborough University & British Geological Survey – Geohazards in Central China; landslides in loess and the 2010 Zhouqu debris flow disaster**

*(To be followed by our Christmas cheese and wine evening).*

**Saturday, 14<sup>th</sup> January 2017 – 6.00 pm**

**Andrew Bloodworth, British Geological Survey – The secret life of your mobile phone: metal supply and digital devices**

**Saturday, 11<sup>th</sup> February 2017 – 6.00 pm**

**Dr Vanessa Banks, British Geological Survey**

**Presidential Address: Hydrogeology of the Peak District**

*(To be followed by our Annual Dinner)*

**Saturday, 11<sup>th</sup> March 2017 – 6.00 pm**

**Dr Adam Smith, Nottingham Natural History Museum – Swimming Plesiosaurs and flying dinosaurs – vertebrate palaeontology at Wollaton Hall**

**Saturday, 8<sup>th</sup> April 2017 – 6.00 pm**

**Dr Julie Prytulak, Imperial College, London – The Biggest Volcano on Earth**

## **LECTURE VENUE**

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.

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

**Saturday, 15<sup>th</sup> October 2016 – 6.00 pm**

**Noel Worley -**

**Mineralisation of the South Pennine Orefield**

Mineralization in the South Pennine Orefield is of the Mississippi Valley-type (MVT) and is concentrated within an area of some 200 km<sup>2</sup>, mainly along the eastern margins of a large inlier, the Derbyshire High, in Carboniferous platform carbonate host rocks. The inlier forms an un-dip promontory of a larger structure, the East Midlands Shelf, and is surrounded by shales and sandstones of the Millstone Grit and Pennine Coal Measures groups. Mineralization probably

began during the late Westphalian (Moscovian, Mid Pennsylvanian), when subsidence due to thermal sag resulted in the limestone being buried to depths of ~4 km beneath younger strata. A palaeohydraulic reconstruction is described based on analysis of mineralized palaeokarst features, which are interpreted as representing hypogenic or deep-seated karst formed by the interstratal circulation of hydrothermal water in a mostly confined hydrodynamic setting. Variscan inversion of N-S faults to the east of the SPO resulted in erosion of Namurian and Westphalian (Upper Mississippian-Middle Pennsylvanian) rocks and created a hydraulic gradient inclined towards the south-west. Acidic F-Ba-Pb-Zn enriched fluid evolved in the Namurian basinal rocks and migrated into fractured limestone. The resultant wall-rock dissolution along existing wrench faults led to the formation of a maze of stratiform mineral deposits (flats) and more irregular spongework-shaped structures (pipes). The presence of hydrocarbon accumulations in the limestones and evidence from fluid inclusions indicates that the mineralizing fluids were chloride/fluoride-rich and compositionally typical of oilfield brine. Isotope evidence demonstrates a sulphate evaporate source of sulphur, mainly from the Chadian (Visean, Middle Mississippian) Middleton Anhydrite Formation. By the late Cenozoic, karstification of exposed carbonate rocks began and the current pattern of epigenic karst drainage started to develop as the regional hydraulic gradient reversed, assuming its present eastward inclined attitude. The mineralized hypogenic karst was overprinted by later drainage systems as the hydraulic gradient changed, and placer deposits were formed from the erosion of existing mineralization. This was accompanied by circulation of meteoric water and resulted in the supergene weathering of the sulphide ore minerals. Eastward underflow of meteoric groundwater also exploited the same mineralization flow paths.

#### **Reference**

Ford, T.D. & Worley, N.E. 2016. Mineralization of the South Pennine Orefield, UK – A Review. *Proceedings of the Yorkshire Geological Society*. **61**, 55-86.

#### **Saturday, 12<sup>th</sup> November 2016 – 6.00 pm**

##### **Dr Nick Longrich**

#### **Giant marine reptiles & whales during the Eocene-Oligocene cooling event**

After the extinction of marine reptiles at the end of the Cretaceous, a new marine reptile fauna evolved in the early Cenozoic, which included giant sea snakes up to 30 feet long, ocean going crocodylians and marine turtles, all of which thrived as far north as London. These animals were largely replaced by a modern marine community, one dominated by marine mammals such as whales and seals and diving birds. How and why this transition took place is poorly understood. A survey of fossils from the late Eocene period of North Africa around 35 million years ago, shows that marine reptiles thrived alongside early whales, before disappearing near the Eocene-Oligocene boundary. The fact that the reptiles co-existed with early whales and the fact that early whales suffered a major extinction at the same time, argues that competition between reptiles and mammals was not the main driver for reptile extinction. Instead the extinction of marine reptiles appears to coincide with the Eocene-Oligocene climatic event which was associated with severe global cooling, the start of glaciation in Antarctica and the beginning of an Ice Age regime. Following the Eocene-Oligocene cooling event, new marine lineages were primarily mammals such as pinnipeds and otters and birds such as auks and diving ducks. Warm blooded vertebrates may have an advantage in colder waters because they can maintain high levels of activity compared to their cold blooded prey. Rapid climate change can drive extinctions and when this climatic change is sustained, it can fundamentally restructure ecosystems.

#### **Saturday, 10<sup>th</sup> December 2016 – 6.00 pm**

##### **Dr Tom Dijkstra**

#### **Geohazards in Central China; landslides in loess and the 2010 Zhouqu debris flow disaster**

China is all too often in the news as a result of geohazards that have a severe impact on lives and livelihoods. The mountainous terrain of Central China is subject to frequent hazards of high intensity such as the 2010 Zhouqu debris flow that destroyed more than 200 buildings and killed

more than 1,500 people. Rapid economic development brings with it expansion of urban centres and infrastructure networks, which not only increases the exposure of the population to natural processes of a dynamic environment, but can also lead to further strains on a landscape that is only marginally stable.

Frequent geohazard events have sparked much research in an effort to better understand processes and material properties that can be used to inform and implement effective strategies to mitigate against the negative consequences of these geohazards. Owing to their location along the eastern margins of the Tibetan Plateau the provinces of Gansu, Sichuan and Yunnan are particularly affected by geohazards. This tectonically active region is strongly affected by continuing uplift and, towards the east and NE, crustal stress release has resulted in the formation of some very large systems of NNE-SSW- and WNW-ESE-trending strike-slip and thrust fault zones. Differences in relative uplift and displacement along these faults have had a significant impact on the present physiography of Central China. Several important geohazard regions can be distinguished, and in this presentation geohazard issues will be highlighted for two regions: landslides in the loess plateau of the Lanzhou region and the debris flows in mountainous fringes along the north-eastern and eastern margins of the Tibetan Plateau.

### **Transport Help Needed**

We have a member who lives in Mansfield Woodhouse who is unable to attend meetings due to disability. If anyone could offer a lift to meetings, please could they contact the secretary to offer assistance.

### **New Member**

Dr William B Jones, Elkesley, Retford, Notts.

### **Society Publications**

- (1) **East Midlands Field Guide;**
- (2) **Sandstone Caves of Nottingham** (3<sup>rd</sup> 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](mailto: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](http://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](mailto: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 November 2016**

**The next Council Meeting will be held on 16<sup>th</sup> November 2016.**

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