

# YORKSHIRE GEOLOGICAL SOCIETY

President: Paul Hildreth



## MEETINGS JUNE & JULY 2019

Saturday 15th June 2019, BGS Keyworth  
POCKET DEPOSITS, KARST AND ENVIRONMENTAL CHANGE

Sunday 16th June 2019 – Field Meeting  
Brassington Formation, Derbyshire

Saturday 6th – Sunday 7th July 2019  
Weekend excursion to Horton-in-Ribblesdale and Ingleton Area



## POCKET DEPOSITS, KARST AND ENVIRONMENTAL CHANGE

Saturday 15th June 2019, 1.30pm – 4.30pm

British Geological Survey, Nicker Hill, Keyworth, Nottingham, NG12 5GG

Joint Meeting with the East Midlands Geological Society

Convened by Jim Riding (BGS) and Andy Howard (YGS)

For directions to BGS Keyworth, see  
<https://www.bgs.ac.uk/contacts/sites/keyworth/home.html>

*(Please note that details may change, including the running order, so please continue to consult our webpage and Facebook pages for updates to the programme)*

- 1:30pm**                    **Welcomes and YGS business**  
*Including presentation of the YGS Research Fund award to Jack Lee, and the Fearnside Award to Madeleine Hann*
- 1:45pm**                    **The Brassington Formation: a remarkable Miocene ‘pocket deposit’ in the Peak District**  
*Dr Jim Riding, British Geological Survey, Keyworth, Nottingham*
- 2.15pm**                    **A Miocene ecosystem in a hole**  
*Dr Matthew Pound, Department of Geography and Environmental Sciences, Northumbria University*
- 2.45pm**                    **Refreshments break**
- 3.15pm**                    **Investigating gypsum karst and sinkholes in Yorkshire**  
*Dr Vanessa Banks, British Geological Survey, Keyworth, Nottingham and Gabriella Williams, Department of Civil and Structural Engineering, University of Sheffield*
- 3.55pm**                    **Chalk Karst**  
*Dr Andy Farrant, British Geological Survey, Keyworth, Nottingham*
- 4:25pm**                    **Vote of thanks and close**

**THE MEETING CAN COUNT AS 3 HOURS CONTINUING PROFESSIONAL DEVELOPMENT (CPD) FOR THE GEOLOGICAL SOCIETY OF LONDON CHARTERED GEOLOGIST AND SIMILAR CPD SCHEMES.**



## ABSTRACTS

### THE BRASSINGTON FORMATION: A REMARKABLE MIOCENE 'POCKET DEPOSIT' IN THE PEAK DISTRICT

James B. Riding (British Geological Survey, Keyworth, Nottingham),  
Vanessa J. Banks, Peter F. Jones, Matthew J. Pound, Peter T. Walsh

The Brassington Formation of the Pennines is the most extensive onshore Miocene succession in the UK. It is preserved as outliers (or 'pockets') in the Lower Carboniferous (Mississippian) Peak Limestone Group. During the Cenozoic, central England underwent substantial uplift, with erosion of post-Mississippian strata from the Pennine axis in the Peak District. The Brassington Formation is therefore highly significant for reconstructing the Cenozoic geological history of the UK. It is non-marine, was derived from Triassic sandstone and is of Mid to Late Miocene in age. The c. 60 outliers of the Brassington Formation occur in three clusters over c. 220 km<sup>2</sup>. They are remnants of a sedimentary block/prism at least 75 m thick and with a volume of c. 10 km<sup>3</sup>. The suffosion of bedrock, aided by aggressive fluids of hypogenic origin, was the major control on subsidence. The calculated volume of the fills in the Bees Nest and Green Clay pockets is 3.7–5.0 × 10<sup>6</sup> m<sup>3</sup>. Referenced to a sub-Miocene surface at c. 450 m OD in pre-subsidence times, the original volume of this subsidence complex was c. 21.8 × 10<sup>6</sup> m<sup>3</sup> and the aggregated volume of the Late Neogene White Peak palaeokarst was at least 0.66 km<sup>3</sup>. Subsidence was associated with Pliocene uplift of the Pennine Axis, suggesting suffosion accommodation of 3 × 10<sup>6</sup> m<sup>3</sup> per km<sup>2</sup> or 244 m<sup>3</sup> per annum.



### A MIOCENE ECOSYSTEM IN A HOLE

Matthew Pound (Northumbria University), Jim Riding, Jennifer O'Keefe,  
Noelia Nuñez Otaño

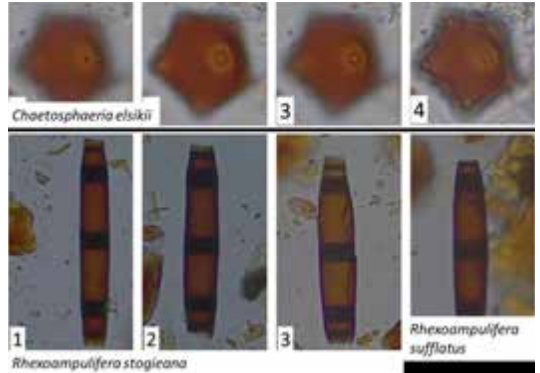
The Brassington Formation is the most extensive Miocene sedimentary succession onshore in the UK. Because of its position on the margin of northwest Europe, the pollen, spores and microfossils from this lithostratigraphical unit provide a unique insight into the response of ecosystems to climate changes that accompanied the Middle to Late Miocene cooling. Previously, all occurrences of the Kenslow Member were assumed to be contemporary, however palynostratigraphy suggests this is not the case. This new interpretation implies that a sequence of fossiliferous horizons is present in the Brassington Formation, rather than a single layer. Using this revised chronology, a new vegetation and climate record for the Atlantic margins of northwest Europe has been produced. Overall, the palynology shows that the oldest pollen assemblage is from the more southern Bees Nest Pit, which represents a subtropical conifer-dominated forest of late Seravallian age (c. 12 Ma). A younger assemblage was observed from the more northern Kenslow Top Pit and indicates that a subtropical mixed forest was present during the early Tortonian (11.6–9 Ma). Continued exploration has also



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revealed a previously unknown fungal component to the assemblage. Amongst the nearly 100 different taxa of fungi are several new species. These provide a unique insight into death, decay and parasitism in the Miocene forests of Europe.



*Left: Fossil wood logs in clay matrix, Brassington Formation (scale = 13 cm)*

*Above: New species of fungal palynomorphs from the upper part of the Brassington Formation. Comparable modern fungi are commonly found on decayed wood, often submerged in freshwater.*



## INVESTIGATING GYPSUM KARST AND SINKHOLES IN YORKSHIRE

Vanessa Banks (BGS, Keyworth) and Gabriella Williams (University of Sheffield), Elisabeth Bowman, Anthony Cooper, Hannah Gow, Oliver Kuras, David Morgan, Paul Shepley, Michael Raines, Stephen Thorpe

Permian rocks strike approximately north to south through the middle of Yorkshire. The sedimentary sequence comprises sandstones, mudstones, limestones and dolomitised limestones with evaporite layers that are dominated by gypsum. The bedrock geology is capped by Quaternary deposits that include till and sand and gravel deposits, as well as the alluvium associated with the rivers. Predominantly to the west of the A1, the density of sinkholes along the line of the Permian rocks reflects the susceptibility of these rocks to sinkhole formation. Notable concentrations of sinkholes occur to the west of Leeming and south of Bedale, where they are associated with glacio-lacustrine deposits, to the north-east of Nosterfield where



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they are associated with glacio-fluvial terrace deposits and in the area of Ripon where they are associated with both till and the glacio-fluvial river terrace deposits.

The association of the sinkholes with a range of different superficial deposits supports the hypothesis that the formational processes are related to dissolution by confined groundwater. In the area of Ripon, where the impact of sinkholes is particularly significant because of the density of urban development, discharge is focused on the line of a buried valley associated with the course of the River Ure. The upward propagation of the karst processes is not fully understood. NERC Urgency Grant funding to support the investigation of a sinkhole that opened in Magdalens Road, Ripon, in 2016 provided the opportunity to trial a suite of nested geophysical techniques. The feature, the research methods and the preliminary findings of this investigation will be described in this presentation. This will be followed with a description of the research proposals to further investigate the sinkhole propagation processes in the context of an EPSRC – BGS funded PhD at the University of Sheffield.

### ACKNOWLEDGEMENTS

This research builds on an existing legacy of British Geological Survey research largely led by Dr A H Cooper.



*Top left: Surface depressions demarcated by the change in vegetation and indicative of sub-surface erosional processes (Photo: Gabriella Williams).*

*Bottom Left: Geological Society of London Field meeting to Ripon in September 2018.*

*Above: BGS introducing the media to micro-gravity surveying in Ripon.*



## CHALK KARST

Dr Andy Farrant, (British Geological Survey, Keyworth, Nottingham),  
Lou Maurice

Mention karst in a UK context and most hydrogeologists think of the classical Carboniferous and other Palaeozoic limestone outcrops where cave systems are common. Many would not consider the Chalk to be karstic, yet it displays all of the classic land-forms associated with more classical karst areas. These include sinking streams, sinkholes, large springs, rapid sink-spring transit times and cave systems. From a hydrogeological perspective, karst is not only present, but also important in creating potential rapid flow pathways for contaminants. This presentation will focus on the style and nature of karst in the Chalk, the type of conduits and cave development present and their relationship to inception horizons and chalk lithostratigraphy.



*Top left: Karst developed on the Seven Sisters Flint, Seaford Chalk Formation, Dieppe. Photo: Andy Farrant, British Geological Survey ©UKRI, all rights reserved.*

*Above: Active karstic conduit developed on a hardground in the Chalk, Etretat, Normandy. Photo: Andy Farrant, British Geological Survey ©UKRI, all rights reserved.*

*Left: Spring outflow from a karstic system in the Kennet catchment, Hungerford. Photo: Andy Farrant, British Geological Survey ©UKRI, all rights reserved.*



## YORKSHIRE GEOLOGICAL SOCIETY FIELD TRIP TO BRASSINGTON AND FRIDEN, DERBYSHIRE

Sunday 16th June 2019, 10.30am to 5.30pm

**Leaders: Vanessa Banks (BGS), Jim Riding (BGS), Peter Jones (University of Derby),  
Matthew Pound (Northumbria University)**

The Brassington Formation of the Peak District central England is the most extensive onshore Miocene deposit in the UK and is preserved as 'pocket deposits' in karstified depressions. It was derived from the weathering of Triassic strata nearby, this unit survived Late Neogene and Quaternary erosion and is entirely siliciclastic. This excursion includes two disused silica sand quarries, which enable all three members within the Brassington Formation to be demonstrated and examined in detail. Registration by email is required in advance, see below.

### SUMMARY ITINERARY

- Meet at the parking place off Manystones Lane (SK 2432 5484), c. 1 km NE of Brassington village, at **10.30 am** prompt.
- We will spend the morning at nearby Bees Nest Quarry and eat our packed lunches there. This is the type section of the Brassington Formation, and all three members are well exposed.
- After lunch we will drive northwest to Kenslow Top Pit, near Friden. This is a much larger disused quarry where we will see the lowermost (sand-dominated) unit, the Kirkham Member, plus the dolomite wall rock and an intriguing glacial raft.
- Return to vehicles by 5.30pm approx.

This field excursion entails some walking over rough ground (approx. 4 km) to access the two sites. Both sites are disused quarries and the sides are relatively steep and somewhat uneven. Wear sturdy footwear and bring rainproof clothing and sunscreen. High visibility jackets and hard hats are not essential but bring them if you have them. Bring a packed lunch, drinks and any snacks required.

Numbers are limited to **25** due to parking constraints. **Registration is required** by email to: [fieldtrips@yorksgeolsoc.org.uk](mailto:fieldtrips@yorksgeolsoc.org.uk) Please include the full name of all attendees in your email. Full details of the meeting points, itinerary and advice on travel and parking will be forwarded on registration.



*Bees Nest Quarry, near  
Brassington, Derbyshire.  
Photograph by Peter T. Walsh in  
1997, reproduced with permission.*



## WEEKEND EXCURSION TO HORTON-IN-RIBBLESDALE AND INGLETON AREA

Saturday 6th July and Sunday 7th July 2019

**Leaders:** John Knight, Jack Soper, Nick Riley

### **SATURDAY 6TH JULY: HORTON-IN-RIBBLESDALE**

**Morning 10.30 – 13.00: Horton Quarry (courtesy of Hanson Aggregates)**

An opportunity to inspect the Mississippian carbonates (Kilnsey and Malham formations of the Great Scar Limestone Group, Arundian - Asbian) which have been the historic objective of the operations of Horton Quarry; also the sub-Carboniferous unconformity and, the more recently exploited, underlying Austwick Formation (Silurian).

Note this is a working quarry and site safety regulations must be strictly observed; bring hard hat, high-vis jacket and stout footwear. Meet at the quarry offices (SD 802 721) (reverse parking must be observed).

Lunch will be taken in the field, packed lunch recommended, although there is scope to obtain sandwiches and other sustenance in Horton-in-Ribblesdale.

### **Afternoon 14.00 – approx. 17.00: Cragghill Farm and adjacent outcrops**

A visit to outcrops of Crag Hill Limestone (Ordovician) to observe relationships between the underlying Ingleton Group (Arenig, Ordovician) and the adjacent younger Austwick and Horton formations of the Windermere Supergroup ( Silurian).

*Sub-Carboniferous Unconformity in Horton Quarry: grits and sandstones of the Austwick Formation (Wenlock, Silurian) dip to the right of the photograph and are overlain by near-horizontal thin limestones with mudstone of the Kilnsey Formation.*







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Subject to final planning and agreement with landowners: vehicles will be left near the entrance to Horton Quarry (SD 805 723) from which point the group will walk south, some 1.25 km, to Cragghill Farm (SD 806 710). The traverse is then northwards back to the vehicles, across the succession of the Horton Formation. The anticlinal Crag Hill Limestone, equivalent to the Coniston Limestone of the Lake District, is of Ashgill age (Late Ordovician) and here must overlie the Ingleton Group strata, which must be just hidden. Above the limestone there follows the Austwick Formation (Wenlock), here thinner than south of the anticline, and then the Horton Formation (Ludlow) of slaty silty mudstones. The overlying Carboniferous strata (Kilnsey Limestone-with-mudstone) will be seen in Gillet Brae and the Ingleton Group (overtaken with downward-facing cleavage) will be seen near the parking area.

If time permits the opportunity may be taken to look at other outcrops in the immediate vicinity of Horton-in-Ribblesdale.

### SUNDAY 7TH JULY INGLETON AREA

All day, meeting from 10.30 through to approximately 16.30

The excursion will spend the full day around the River Doe section immediately north-north-west of Ingleton. The objective will be to inspect the Ingleton Group sediments (Arenig, Ordovician) and the structural geology and cleavage and also outcrops of the unconformably



*Detail of the Sub-Carboniferous Unconformity showing the more steeply dipping grits and sandstone of the Austwick Formation (Wenlock, Silurian) overlain by a succession of thin interbedded limestones and mudstone of the Kilnsey Formation, which is here interrupted by a massive rubbly brecciated unit of carbonate mud with limestone and rounded siltstone clasts.*



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overlying limestones of the Great Scar Limestone Group (see Yorkshire Rocks and Landscape, Excursion 1).

The group will meet and cars will be left in the area of Storrs Common (SD 702 733), on the roadside approximately 1 km east of Ingleton village centre, on the road leaving Ingleton in the direction of Hawes (B6255).

Lunch will be taken in the field, bring a packed lunch. Although the total walking distance may not exceed 3 km, participants should come equipped with stout footwear suitable for scrambling on sometimes slippery surfaces.

**GENERAL:** To assist organisational planning, participants are requested to register their intent by email to: [fieldtrips@yorksgeolsoc.org.uk](mailto:fieldtrips@yorksgeolsoc.org.uk) Please include in your email the names of all participants and which day(s) you/they wish to attend. This will ensure that any final changes in the programme can be advised and the obligatory health and safety risk assessment can be issued to participants before the event.



*Quarry in the Ingletonian, near Ingleton*



During the first few months of my presidency it has been a pleasure and a privilege, on behalf of the Society and its members, to present cheques to successful applicants for the Fearnside Award and Research Fund. I shall be making further, similar presentations at our meeting scheduled for June 15th at BGS, Keyworth. We look forward to learning about the outcomes of their research at future themed indoor meetings and/or as papers submitted to the Proceedings.

The Society's ability to make these financial awards is of course dependent upon donations or bequests from members or their families. The Research Fund for example is the outcome of a very generous, anonymous donation and since its launch in autumn 2018, Council has approved four awards to early career geologists and independent researchers in support of their projects.

Clearly, the number of awards that can be made depends upon finite resources and their efficient management. Being able to offer these awards inevitably brings the YGS to the



*Paul Hildreth leading a group from the Leeds GA examining the Ulceby Marl at North Landing, Flamborough.*



attention of students, researchers and local societies and should attract membership to the Society. Boosting these finite resources would be beneficial to all and would give the Society greater flexibility in making awards in the future. I write in the hope that there might be current members who might consider contributing to the "pot". Please feel free to have a word either in person, by telephone, letter or e-mail if you feel you might be willing to contribute; all conversations and any correspondence will be dealt with in the strictest confidence.

Like me, you may be enjoying watching the latest series of ITV's "Victoria". Just before the close of episode 2 there is a scene showing the Queen alone on a beach in what is clearly an inlet of a chalk coastline. It is of course supposed to be a beach close to Osborne House on the Isle of Wight but the glacial till and gravels capping the chalk cliffs indicate a more northerly location. In the same scene, fellow 'chalkoholics' will have recognized, in the background, the Ulceby Marl dipping towards the beach and reaching beach level at the mouth of a small cave. This feature, together with the film crew's need for suitable access, identifies the location as Flamborough North Landing.

Finally, the coming months promise to be a period of enrichment as the opportunity arises to take part in the events comprising the "fieldwork season". I hope to venture further west than normal this year, onto sub-Jurassic country, and have already booked my accommodation for the Horton/Ingleton weekend in early July. Before that I shall be with the Huddersfield Geology Group's trip to Anglesey in May and as many of the exciting offerings in Yorkshire Geology Month that I can manage. I hope to meet up with many of you on one of the many organized outings.

**Paul Hildreth**



The Society will be launching its 2019 call for applications to the YGS Research Fund and Fearnside Award in May.

The YGS Research Fund provides grants of up to £1000 to individuals or small teams to support research in the Earth Sciences with a preferred, but not exclusive, connection to the North of England - this may be by birth, education, affiliation to a research establishment or research on the geology and landscape of the region itself. The scope of eligible research is broad, and the Society wishes to encourage applicants who are working independently of formal supervision and financial support, especially where this may assist with publication.

The Research Fund was launched in 2018. In its first year we received 14 strong applications, and made contributions to 4 projects, all of which are proceeding in 2019:

Detailed logging and geochemical sampling of early Jurassic mudstones at Redcar, exposed by the Beast from the East storm in 2018 – Jed Atkinson (University of Leeds)

Preservation of a major new Pliosaur find from the Kimmeridge Clay of North Lincolnshire – Scunthorpe Pliosaur Project Team (voluntary researchers)

Comparative dating of the last deglaciation on the western and eastern flanks of the Pennines – Andy Emery (University of Leeds)

Structural appraisal and dating of the Cleveland Dyke and associated cross-cutting carbonate veins – Jack Lee (Durham University)



*Cliff Rigg Quarry, Great Ayton, showing the contact between the Cleveland Dyke and adjacent Cleveland Ironstone Formation country rock, March 2019. Photo: Andy Howard.*



Launched in 2016, the YGS Fearnshides Award provides grants of up to £500 to support research by early career Earth Scientists with a connection to the North of England. Awards are intended to support clearly specified research or activities that add value and impact to a postgraduate project, such as presenting research outcomes at a major conference or following up a newly identified research opportunity.

In 2018 we received 9 applications and made contributions to travel costs for 2 projects:

Taxonomic re-appraisal and 3D modelling of ichthyosaur specimens in museums at Whitby and in Germany – Rebecca Bennion (University of Liège)

Field mapping and hazard appraisal of catastrophic debris flows in the Moroccan High Atlas – Madeleine Hann (University of Manchester)

Please see the Grants and Awards page on the YGS website for more details about these grants (<http://www.yorksgeolsoc.org.uk/awards.php>), and to download an application form. In 2019 we anticipate making two Research Fund awards and one Fearnshides Award, though additional grants may be considered if we receive a large number of high quality applications. Deadlines for applications are 31 August (Research Fund) and 30 September (Fearnshides Award).

**Andy Howard, General Secretary YGS**



*Presentation of the Research Fund cheque for £1000 to the Scunthorpe Pliosaur Project team, Scunthorpe Museum, February 2019. Photo: Andy Howard*



**Saturday 21st September – Field Trip: (Provisional)**

**Millstone Grit and the poetry of Ted Hughes**

Leader: Mike Stephenson: Widdop, near Hebden Bridge

**Saturday 12th October – Indoor Meeting:**

**Ancient Air: evolution and perturbations of the Earth's atmosphere**

University of Leeds

**Saturday 2nd November – Indoor Meeting:**

**De-carbonisation of the Northern Powerhouse**

Tempest Anderson Hall, Yorkshire Museum, York

**Saturday 7th December:**

**Annual General Meeting, President's Day and Buffet**

Weetwood Hall, Leeds

**IMPORTANT:** Please continue to consult our programme page at  
<http://www.yorksgeolsoc.org.uk/EDITABLE/programme.pdf> for updates to the programme.



## THE JOHN CATT SYMPOSIUM

### “Hertfordshire Geology & Landscape”

Saturday July 13<sup>th</sup> 2019

Bayfordbury Campus, University of Hertfordshire

A full day of varied talks, including:

Chair / introduction / summing up: Haydon Bailey, Nick Pierpoint

Deep geology: Janet Wright

Hydrogeology: Rob Sage & Ilias Karapanos

Sinkholes: Clive Edmonds

Little Heath SSSI: Clive Maton/Tim Atkinson

Ice age River Stort: Mike Howgate

Hertfordshire Archaeology: Stewart Bryant

Soils: John Hollis & Steve Hallet

Hertfordshire Puddingstones: Chris Green

Recent remapping of the Chalk: Andy Farrant

The complete programme will soon be available

Cost: £25, to include buffet lunch and other refreshments.

Places are limited. Please book early to avoid disappointment.







## CORRESPONDING SOCIETIES

Please contact the society representatives and/or websites shown for the latest information, and if you would like to attend a particular meeting as a guest

### **Craven & Pendle Geological Society**

<http://www.kabrna.com/cpgs/>

Venue for indoor meetings: St. Joseph's Community Centre, Bolland Street, Barnoldswick BB18 5EZ at 7.30pm.

### **Cumberland Geological Society**

<http://www.cumberland-geol-soc.org.uk/>

### **East Midlands Geological Society**

[secretary@emgs.org.uk](mailto:secretary@emgs.org.uk) <http://www.emgs.org.uk>

Usual meeting place: School of Geography, Nottingham University.

### **Edinburgh Geological Society**

[secretary@edinburghgeolsoc.org](mailto:secretary@edinburghgeolsoc.org) <http://www.edinburghgeolsoc.org/>

Lectures are held in the Grant Institute of the University of Edinburgh, West Mains Road, Edinburgh, at 7:30pm, except where stated otherwise.

### **Geologists' Association**

See the GA's events calendar at <https://geologistsassociation.org.uk/calendar/>

### **Huddersfield Geology Group**

<http://www.huddersfieldgeology.org.uk/>

Indoor Meetings at Greenhead College, Huddersfield, at 7.15pm unless otherwise stated.

### **Hull Geological Society**

<http://www.hullgeolsoc.co.uk/org>

Usual meeting place for indoor lectures: Department of Geography, University of Hull, at 7.30 pm. N.B. for security reasons the door is locked at 7.40pm.

### **Leeds Geological Association**

[lga.sec@btinternet.com](mailto:lga.sec@btinternet.com) <http://www.leedsga.org.uk/>

Usual meeting place for indoor lectures: Rupert Beckett Lecture Theatre (Michael Sadler Building) Leeds University at 7.15pm.



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### LEICESTER LITERARY & PHILOSOPHICAL SOCIETY – SECTION C GEOLOGY

<http://www.charnia.org.uk/>

Usual meeting place for indoor lectures (unless otherwise stated): Lecture Theatre 3, Ken Edwards Building, University of Leicester at 7.30pm, refreshments from 7.00pm.

### MANCHESTER GEOLOGICAL ASSOCIATION

[secretary@mangeolassoc.org.uk](mailto:secretary@mangeolassoc.org.uk) <http://www.mangeolassoc.org.uk>

Usual meeting place for indoor lectures: Williamson Building, Department of Geology, University of Manchester.

### MID-WEEK GEOLOGY GROUP IN YORKSHIRE

[mwgyorkshire@hotmail.com](mailto:mwgyorkshire@hotmail.com) <http://www.mwgyorkshire.org.uk>

Informal mainly amateur and retired group that organises monthly field meetings or museum visits on Tuesdays, Wednesdays or Thursdays.

### NORTH EASTERN GEOLOGICAL SOCIETY

<http://www.negs.org.uk>

Lectures are at 7.30pm in the Arthur Holmes Lecture Room, Science Laboratories Site, University of Durham.

### NORTH STAFFORDSHIRE GROUP OF THE GEOLOGISTS ASSOCIATION

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

Usual meeting place for indoor meetings: William Smith Building, University of Keele at 7.30pm.

### ROTUNDA GEOLOGY GROUP (SCARBOROUGH)

<http://www.rotundageologygroup.org/>

The Education Room, Woodend, The Crescent, Scarborough YO11 2PW.

### WESTMORLAND GEOLOGICAL SOCIETY

[mail@westmorlandgeolsoc.org.uk](mailto:mail@westmorlandgeolsoc.org.uk) <http://westmorlandgeolsoc.co.uk/>

Meetings are on Wednesdays and start at 8 pm (unless otherwise stated) and are held in the Abbot Hall Social Centre, Kendal.



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### YORKSHIRE PHILOSOPHICAL SOCIETY GEOLOGY GROUP

<https://www.ypsyork.org/groups/geology-group/>

### YORKSHIRE REGIONAL GROUP OF THE GEOLOGICAL SOCIETY

<https://www.geolsoc.org.uk/yrq>

Contact: Mark Lee, Secretary: [Mark.Lee3@atkinsglobal.com](mailto:Mark.Lee3@atkinsglobal.com)

Meetings are held at the Adelphi Hotel, Leeds



## NEXT YGS CIRCULAR DEADLINE: 31ST JULY 2019

Please send all copy (including Corresponding Society programmes for August – November) to the Circular and Website Editor, Patrick Boylan - **email: [web@yorksgeolsoc.org.uk](mailto:web@yorksgeolsoc.org.uk)** or by post to: 2a Compass Road, Leicester LE5 2HF.



## KEY YORKSHIRE GEOLOGICAL SOCIETY CONTACTS

<http://www.yorksgeolsoc.org.uk>

**Paul Hildreth, President:** [president@yorksgeolsoc.org.uk](mailto:president@yorksgeolsoc.org.uk)

**Andy Howard, General Secretary:** [secretary@yorksgeolsoc.org.uk](mailto:secretary@yorksgeolsoc.org.uk)

**David Blythe, Membership Secretary:** [membership@yorksgeolsoc.org.uk](mailto:membership@yorksgeolsoc.org.uk)

**John Holt, Treasurer:** [treasurer@yorksgeolsoc.org.uk](mailto:treasurer@yorksgeolsoc.org.uk)

**Patrick Boylan, Circular and Web Editor:** [web@yorksgeolsoc.org.uk](mailto:web@yorksgeolsoc.org.uk)

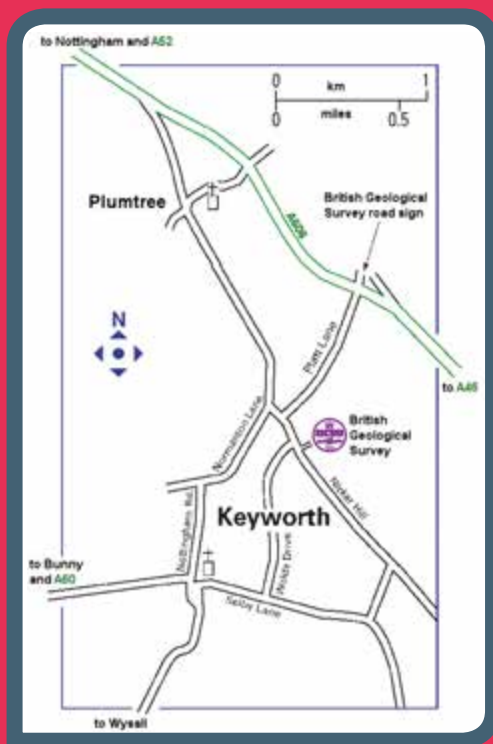
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*Please Note: Articles and abstracts published in the YGS Circular reflect the views and opinions of the individuals writing those parts of the Circular and do not necessarily represent the views of Council or of the Society as a whole.*



*Front Cover: Spectacular karst scenery of Harboro' Rocks, overlooking the Miocene pocket deposits of Bees Nest Mine, Brassington Photo: Andy Howard*