

Manchester Geological Association Newsletter ~ September 2008



www.mangeolassoc.org.uk

President: Christine Arkwright PhD

Dear Member,

I hope that you all had a good summer. The MGA has been very active in the field this year despite the weather, so thanks Jane for a super programme! Reports on two trips follow. We still have a couple of field trips to go, before we hang up our boots and hammers for the winter. See page 6

IMPORTANT ANNOUNCEMENT

Due to a change in the University room letting arrangements, we cannot hold our meetings in the Williamson Building at present. Our lectures will be in the Samuel Alexander (Arts) Building until further notice. Please see the campus plan on page 10.

Well that's a facer isn't it!!.. However, thanks to Jim, we have a superb winter programme to look forward to starting on October 1st with Professor David Siveter's talk on "Silurian Soft Bodied Sensations" with 3D modelling. Please note that all the afternoon seminars will start at 1.00 pm.

Derek Brumhead has been very busy collecting and organising our Archives. These are now housed at the Central Library. If anyone has old photos or reports of our doings Derek would be pleased to receive them. Best wishes to all.....see you soon

Mary Howie newsletter editor

PS Some members are already signed up to electronic newsletters.... You can have this newsletter in glorious Technicolor if you wish, just let me know, by email. MDH

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Quick Diary 2008 -9

Field Trips

21 September	Ingleton and White Scar Cave ~ low mobility field trip
10 / 13 October	Isle of Man Weekend visit
19 October	Liverpool Urban Geology ~ field trip

Lectures and Seminars

1 Oct 7.00 pm	Lecture	Silurian Soft-bodied Sensations!
8 Nov 1.00 pm	Seminar	Karst Landscapes
6 Dec 1.00 pm	Seminar	The Welsh Basin, New Thoughts
17 Jan 1.00 pm	Seminar	The Cretaceous World
18 Feb 7.00 pm		AGM & Presidential Lecture
18 Mar 6.30 pm	Joint Lecture	Environmental Magnetism

MGA field trip to Quarry Bank House Secret Garden ~ Styal Mill ~ June 2008

Some 30 members, guests and Rockwatchers came along for a great field day, led by Fred Broadhurst in the morning and Fred Owen in the afternoon on Saturday June 14th.

At the invitation of the National Trust, the two Freds have been working on the geology of the newly opened quarry garden for a couple of years. They have written a leaflet about the geology, a laminated précis of which is now being lent to visitors to the garden by the NT.

We spent the morning in the quarry garden. There are several superb exposures of Triassic sandstones in the "Secret Garden". We had the benefit of both the leaflet and their expertise in explaining the depositional environments. These well-bedded sandstones were formed in the middle of a huge continent, situated at 20°N. Some are water-lain following sporadic downpours and flash floods, others are wind blown aeolian dunes. The bright red colour is due to a coating of



Fred B explains how dunes form, Fred O and members listen.

Ann Phillips ©

ferric oxide

on the sand grains, which also provides the cement to "glue" the rock together.

Subsequent earth movements uplifted and tilted the strata, leaving them with a dip of 49°, far greater than the original angle of repose of 25° to 30° for sand grains on a wind-blown dune .

After lunch Fred Owen led us round the Styal Park Geological Trail that he devised as part of his studies in 2000.

Nature has had its way with some of the exposures, for the River Bollin is very active here and has removed some of the riverbank paths, so that you can no longer get up close and personal with some of the rocks. However Fred O's intimate knowledge of the terrain enabled him to show us subtle geomorphological features that the casual visitor would have missed. We had a good look at deposition currently (no pun intended) taking place in the river and were able to relate that to structures found in the rocks. We did get close to a big exposure in Worms Hill Quarry and here Fred B demonstrated how the old quarrymen extracted the big blocks by hacking out a trench all round them, chisel marks show the direction of their blows!



Dewatering structures probably caused by earthquakes! MDH

A downloadable copy of their explanatory notes to the exposures in the Quarry Garden will soon be on our website in PDF form. If you haven't got computer access and want a printed copy, then please send me a SAE and I'll post one to you. (my address is on page 9)

You should all have received a copy of Fred Owen's Geo trail in the past, if not Fred O still has some to dispose of.

We hope to hold a MGA "event" at Styal next summer... watch this space!

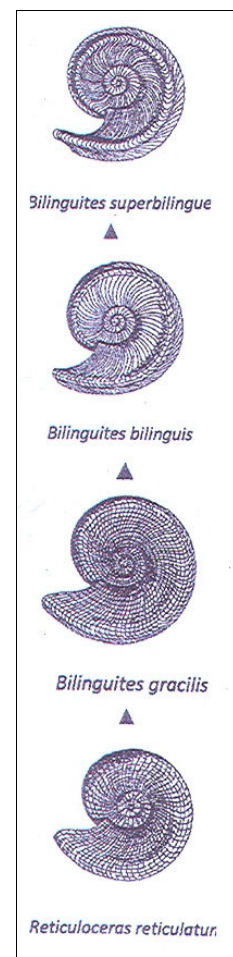
Mary Howie

Deep Water! Abundant Life or Lifeless Mud?

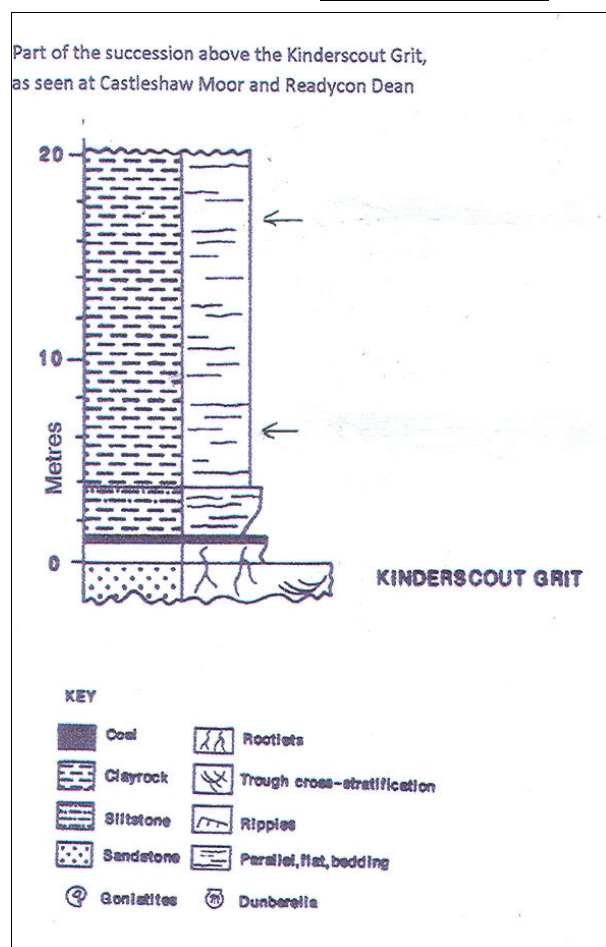
On Saturday 12 July Fred Broadhurst, Joe Macquaker and Paul Aplin treated us to an exceptional visit to Namurian, Upper Carboniferous, sedimentary sequences at Castleshaw Moor and Readycon Dean, near Denshaw. This field trip was exceptional for several reasons:

First there was the evolutionary sequence of the goniatites (marine, coiled shells, ancestral to the ammonites) from *Reticuloceras reticulatum* through *Bilinguites gracilis* and *Bilinguites bilinguis* to *Bilinguites superbilingue*. The earliest, *Reticuloceras reticulatum*, has a criss-cross pattern of spiral and radial ribs. The four species shown in the diagram represent stages in evolution, during which the spiral ornament progressively reduced. These shells are abundant in thin bands of clayrock, known as marine bands, each representing a rise in sea level to flood a delta top, implying that the sediments between the marine bands are non-marine, ie fresh or brackish water in type. At Castleshaw Moor we examined the *Bilinguites bilinguis* marine band. It was pointed out that recent research in this area, by Kevin Riley (an MGA member who sadly died a few years ago) established the presence of goniatites in the sediments between the *gracilis* and *bilinguis* marine bands, indicating that this succession, at least, is all marine.. There is no evidence to suggest the reasons for the gradual change in ornamentation.

Using hammers and chisels to split the clayrock along the bedding, a multitude of fine samples of the various goniatites were collected by the enthusiastic participants, among them two very keen Rockwatchers!



Second, came the controversy about the depositional process by which the 'marine bands' formed. Fred gave the conventional explanation of the past 150 yrs saying that the regional environment was a southerly prograding delta top, periodically colonized by vegetation and swamps – the source of the coal seams. Occasional rises in sea level deposited marine sediments over the delta top, sometimes in shallow, sometimes in deeper water and forming the marine bands characterized by the goniatites. The conventional view held that deeper water sediments were considered to be anoxic and lifeless (but with the remains of swimmers, like the goniatites from higher levels in the water column). However, Joe explained that recent electron microscope examination of 20 micron thin sections of the clayrock, showed that it had been full of life! In fact it is has been shown that there is a continuous succession of goniatites throughout the clayrock and not just in the marine bands. There is also a myriad of microscopic coccoliths, forams, faecal pellets, burrows and fragments of vegetation. So, far from being anoxic there was a rich supply of oxygen in the water as well as abundant organic matter for food for bacteria and marine animals. The clayrock, which has a particle size (by definition) of less than 62.5 microns, also displays a range of sedimentary



structures like ripples, slumps and turbidites as well as evidence of storms. This combination indicates a shallow water, shelf delta environment subject to variable sediment input, wave action and sea level fluctuations.

The tougher marine bands stand out from the clayrock, see Photo 1, because the particles are cemented by calcium carbonate – demonstrated with hydrochloric acid. Joe explained that this indicated a break in sediment deposition to give time for a complex series of chemical reactions promoted by bacterial respiration (oxygen to CO₂) and digestion of organic matter to form methane. These reactions produce the bicarbonate ions which combine with calcium to form the calcium carbonate cement.



The clayrock, being rich in organic matter which decomposes to methane, is a potential source of natural gas. Watch this space for those gas rigs! The exposure shows brown staining indicating the presence of ferric oxide produced by weathering (oxidation) of the pyrites in the clayrock. This process also forms sulphuric acid which reacts with calcium carbonate to form gypsum, small white patches of which could be seen on exposed, weathered surfaces.

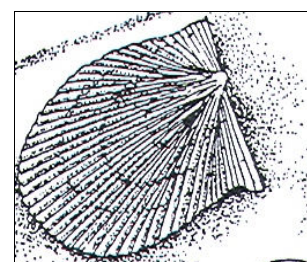
Fred conjectured about the reason for the ‘marine incursions’. He said there were about ten cyclic units, see Photo 1, each about 1 m thick, spanning a period of, say, 2 million years giving a periodicity of 200,000 years, which fits neatly with the frequencies of Milankowich Cycles. Joe accepted this possibility but added that the rate of deposition could not have been constant because the marine bands indicate periods of no deposition.

Third, having collected many excellent, but very fragile, goniatite samples we enjoyed a hearty lunch at the Junction Inn in Denshaw. Joe then did a laptop presentation displaying the remarkable sedimentary features observed in the electron microscope images of the clayrock described above. Minerals present include muscovite, quartz, pyrite and kaolinite – clay formed by weathering of feldspars. In my experience this is the first time we have had a lunchtime lecture on a field trip!



'Looking for cleats and *Dunbarella*'

After lunch we went to Readycon Dean where a coal seam above the Kinderscout Grit was exposed. Fred explained that ‘cleats’ in coal seams have a NW-SE orientation, which is pervasive throughout Britain, and are indicative of tension during its formation. Rootlets were clearly seen in the white seat-earth beneath the coal. At this locality many fine examples of *Dunbarella speciosus* were unearthed from the clayrock of the *Bilinguites gracilis* marine band.



Dunbarella speciosus

This exceptional day was brought to a close by Jane thanking our three leaders for their expertise and time and by presenting Joe with a farewell card from MGA members, expressing their thanks for his role as our President and their best wishes for his future in Newfoundland....a likely venue for another exceptional field trip!

Fred Owen 27 August 2008

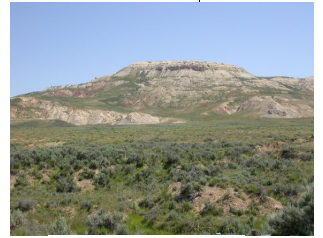


Mount Rushmore

Dinosaurs, Geysers and Gorges of the Wild West

A Study tour of the

Geology, Scenery and Natural History
of Wyoming and Colorado July 2009



Fossil Butte

Led by Dr John Nudds and Professor Paul Selden
They will be visiting the Fossil Lagerstätten featured in their new book
as well as many sites of geological and historical interest,
from Mount Rushmore to Yellowstone and Bighorn to Fossil Butte!

For details and a full programme of the tour contact John Nudds by email
at john.nudds@manchester.ac.uk or at The University of Manchester, Oxford Road,
MANCHESTER, M13 9PL, UK, or Tel. +44 161 275 7861

Fossil Ecosystems of North America (2008), by Nudds & Selden
http://www.mansonpublishing.com/science/sci_titles/NuddsSelden.html

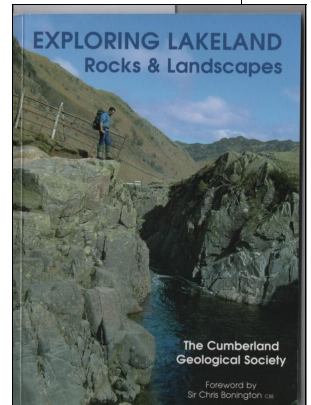


Hyracotherium (Dawn Horse) from
the Green River Formation

Cumberland Geological Society have recently published this super new guide book
to Lakeland rocks, which compliments their previous guide book published in 1982.
At £9.50 it is a real bargain ... 17 locations are visited, each with a coloured
geological map and practical details of routes, transport etc.. There are many
beautiful coloured illustrations and a comprehensive glossary. It is written in
accessible language, but still has lots of sound geological content. Whether you are
going up on the tops or just wish to wander round the valley bottoms, this is a must
for your bookshelf, or a lovely Christmas gift for a friend or relation. Jane Michael
is getting hold of some copies for us, so put your order in.

Mary Howie

Price:: £9.50 (paperback) ISBN : 978-0-9558453



CCE Courses for the Public - 2008 at Manchester University

Brymbo Fossil Forest - field trip ~ Tutor: Dr Jacqui Malpas

Sunday 5 October 2008

Folds, Faults and Maps ~ Tutor: Paul Aplin

6 Thursdays 6.30-8.30 pm starting 16 October 2008

Geological Maps: How are they made? ~ Tutor Dr Chris Arkwright

6 Wednesdays from 1.30-3.30 pm starting 5 November 2008

Geology of Iceland ~ Tutor: Dr John Stevenson

10.00 am - 4.00 pm Saturday 22 November 2008

Volcanoes of the World ~ Tutor: Dr John Stevenson

8 Wednesdays from 1.30-3.30 pm starting 21 January 2009

For more details of these and other courses see

www.manchester.ac.uk/coursespublic or ring 0161 275 3275 to request a brochure

Manchester Geological Society



Remaining OUTDOOR EVENTS 2008

DATE **Sunday 21 September 2008**

Venue: Ingleton and White Scar Cave Joint with OUGS

Leader: Norma Rothwell and Jane Michael + White Scar Cave Guide

Time: Probably 10am - 4pm

Description: Whilst this is a Low Mobility Excursion to the Ingleton Area, all are welcome. The aim is to view Ordovician metamorphosed basement rocks from the viewpoint of Ingleton Quarry and secondly to observe Carboniferous Limestone features including weathering, spring-line settlements, an unconformity and industrial use. Ending with an overview of the landscape of the area. Very easy walking on tarmac paths or level ground. Distance is only about 100m from the cars. Sensible shoes required. After lunch we will be taking a guided tour of White Scar Cave (fee payable).

Contact: Jane Michael

DATE **Friday 10 – Monday 13 October 2008**

This trip is now fully booked

Venue: Isle of Man

Leader: John Barker

DATE **Sunday 19 October 2008**

Venue: Urban Geology in Liverpool

Leader: Alan Diggles

Time: 10.30am - 4pm

Description: To view some natural outcrops and building stones in the City Centre. The itinerary of 4km on flat terrain will include St Georges Hall, Everton Gardens, the Metropolitan Cathedral and the Anglican Cathedral.

Contact: Jane Michael

Booking with Jane Michael is essential for all of our outings

For Field Excursions contact Jane Michael email outdoors@mangeolassoc.org.uk

Further information about the MGA from the Hon. Gen. Sec. Nick Snowden, 41, Merston Drive, East Didsbury, M20 5NT tel. or email info@mangeolassoc.org.uk or go to our website www.mangeolassoc.org.uk

VISITORS ARE ALWAYS WELCOME

St Bede's college have booked **Iain Stewart** (of *Journeys From The Centre Of The Earth* TV fame) to give their Christmas lecture. The date (not yet confirmed) will be announced at our lectures. MGA members are invited, so look on their website for more information. ...soon.

A Free Magazine!!

If you have internet access you can request a PDF copy of "**Earth Heritage**, a free geological and landscape conservation magazine, by emailing Seabury Salmon on mail@seaburysalmon.com . It is published twice a year and has interesting articles covering many aspects of geology.

Manchester Geological Association



Programme of Indoor Meetings - 2008/9

Wednesday 1st October 2008 - 7 pm

"Silurian Soft-Bodied Sensations: A Unique Window on the Evolution of Life"

Professor David Siveter, University of Leicester

Saturday 8th November 2008 - "Karst Landscapes and Processes" 1.00 pm

Underground Secrets: Speleothems and Fossilized Weather

Professor Ian Fairchild, University of Birmingham

Karst in Ireland

Professor John Gunn, University of Birmingham

Saturday 6th December 2008 - "The Geology of North Wales" 1.00 pm

Anglesey Enigmas, Dr. Jack Treagus, University of Manchester

New Investigations in the Arfon Sub-Basin, Dr. David Schofield, BGS

Geological Architecture of the Type Area of the Llandovery Series, Dr. Jeremy Davies, BGS

Saturday 17th January 2009 - "The Cretaceous World" - 1.00 pm

Dr. Peter Skelton, Professor Bob Spicer, Professor Simon Kelley, Dr. Iain Gilmour,
Open University

Wednesday 18th February 2009 - AGM & Presidential Address 7.00 pm

"Mam Tor: a Landslide still on the Move"

Dr. Christine Arkwright, University of Manchester

Wednesday 18th March 2009 Evening Lecture 6.30 pm

"Magnetic Lakes and Trees: What Environmental Magnetism can tell us"

Professor Barbara Maher, University of Lancaster

Joint Meeting with Geographical Association at 6.30 pm

Further information about the MGA from the Hon. Gen. Sec. Nick Snowden, 41, Merston Drive, East Didsbury, M20 5NT tel. 07932 927040, or email info@mangeolassoc.org.uk or go to our website www.mangeolassoc.org.uk or from Indoor organiser - Jim Spencer

Following new room letting arrangements at the University, our indoor meetings will be held in the Samuel Alexander Building (ARTS) see Campus Plan on page 10.

VISITORS ARE ALWAYS WELCOME

Lecture Notes for MGA Indoor Meetings Autumn 2008

**Wednesday 1st October 2008 – "Silurian Soft-Bodied Sensations:
A Unique Window on the Evolution of Life" Professor David Siveter, University of
Leicester**

Our understanding of the history of life on Earth relies heavily on the fossil record, and especially on rare cases of so-called 'exceptional preservation' where soft parts of animals and entire soft-bodied animals are preserved. Such exceptionally preserved fossils provide an unparalleled view of animal palaeobiology and biodiversity and are crucial to unravelling the evolution of life. The lecture will focus on illustrating recently discovered exceptionally preserved fossils from 425 million year old Silurian rocks of Herefordshire in the Welsh Borderland. This is a fossil biota of global importance, containing representatives of many major groups of animals. They are being studied by various methods, including reconstruction in 3-D using computer techniques to create 'virtual fossils'. These fossils are crucial in helping to fill a gap in our knowledge of the history of life and to resolve controversies about the relationships of animals still alive today.

**Saturday 8th November 2008 – "Karst Landscapes and Processes"
Professor Ian Fairchild, University of Birmingham
Professor John Gunn, University of Birmingham**

Caverns bedecked with stalactites and stalagmites; rivers that vanish into their rocky beds, only to reappear again, springing out of the ground some miles away; extensive pavements of bare rock with deep, intricate crannies harbouring rare ferns and other plants.

All of these morphological features of limestone terrains go by the collective name of *karst*; all may be seen within fifty miles of Manchester; all are due to the chemical action of acid groundwaters or rain upon limestone, which consists chemically mainly of calcium carbonate, to produce the soluble bicarbonate, or the corresponding reverse reaction to precipitate the insoluble carbonate again.

**Saturday 6th December 2008 – "The Welsh Basin: Some New Thoughts"
Dr. Jack Treagus, University of Manchester,
Dr. David Schofield and Dr. Jeremy Davies, BGS Keyworth**

North Wales, with its rocky coasts and craggy mountains, scene of many happy family holidays, offers some very interesting geology, consisting as it does for the most part of Palaeozoic and older rocks. The Precambrian and Cambrian Monian and Arvonian sequences of Anglesey and the Lleyn Peninsula form the ancient heart of this country. They are surrounded in turn by the Ordovician slates and volcanics of Snowdonia, and the Silurian shales and turbidites of the Welsh Basin. Younger Carboniferous rocks occur along the northern coast, from the Clwyd Mountains overlooking the Dee Estuary, to Llandudno and Anglesey. We will be looking at a selection of these during the afternoon.

Copies of Jack Treagus' newly published Excursion Guide to Anglesey will be for sale on the day.

Lecture notes for 2009 will follow in the December newsletter.



Who's Who in the MGA Council 2007~2008

President	Dr Christine Arkwright
Vice President	situation vacant
General Secretary	Nick Snowden
Membership Secretary	Fred Owen
Treasurer	Niall Clarke
Indoor Meetings Organiser	Jim Spencer
Field Excursions Organiser	Jane Michael
News Letter Editor	Mary Howie
Web Site	Sue Plumb
RIGS Group	Marjorie Mosley
Ex President	John Price
Minutes Secretary	Kathleen Mais
Archivist	Derek Brumhead
Other Council Members	President Manchester University Geol. Society (ex officio)

MGA email addresses :- To contact our President or either of our Secretaries email info@mangeolassoc.org.uk

for Jane Michael and field visits - outdoors@mangeolassoc.org.uk

for Jim Spencer and indoor meetings lectures@mangeolassoc.org.uk

for Mary Howie and the newsletter - newsletter@mangeolassoc.org.uk

MGA members are welcome guests at other NW Geological Societies activities for further details look on their websites via links from ours.

Leeds Geological Society

Contact Anthea.Brigstocke

27 Sep Regionally Important Geological Sites (RIGS) and the role of the volunteer in geological site preservation

Liverpool Geological Society

Contact Joe Crossley

Oct 5 @ 3 pm in The World Museum, William Brown Street, Liverpool - Distinguished Visitor's Address by Dr Allan Chapman of the University of Oxford - 'Dr Edward Halley FRS (1656-1742): Pioneer of Geomagnetism and Geophysics.'

Oct 14 - The Presidential Address by Dr Frank H Nicholson on 'Periglaciation - a neglected area of Earth Science'.

Nov 4 - 'Gold Exploration in Ireland' by LGS Member Vaughan Williams.

Nov 18 - 7.30 pm - 'Glaciers, Glaciations and Global Warming' By Dr Peter Crimes, University of Liverpool (retired)

Nov 25 - 150th Session DIY Geological Quiz and Cheese and Wine.

North Staffs Geological Association

Contact Gerald Ford,

9 Oct 7.30 pm Christine Blackmore, Wardell Armstong "Landfill Engineering – protecting the Environment".

6 Nov 7.30 pm The Professor Wolverson Cope Annual Lecture Prof. Aubrey Manning "2008 - UN International Year of Planet Earth."

4 Dec 7.00 pm Xmas Social and talk by Bob Roach, "Travels of a young Geologist in North America: Reconnaissance Mapping in The Canadian Shield"

Oldham Geological Society

Contact Jo Holt

24 Sept 7.30 pm AGM Werneth centre , Oldham

22 Oct Photo evening

25 Oct TBA

10 Dec Quiz and nibbles

Open University Geological Society North West

Contact Ian Barrow

18 Oct Field trip Denshaw area, Lancashire Namurian Goniatites on top of the Pennines : Fred Broadhurst

30 Nov Lecture afternoon Rainhill village hall Merseyside England Talks on Volcanology

Shropshire GS

Contact David Pannet

Yorkshire Geological Society

Contact P.. Boylan

17th to 19th October: Indoor and Field Meeting at Scarborough: William Smith, John Phillips and the Rotunda Museum (joint meeting with the History of Geology Group of the Geological Society - HOGG) (see below)

25th Oct: Hull University: Geology south of the Humber, down Lincolnshire way. (joint meeting with the Hull Geological Society) Saturday 29th November: York St Johns University: Annual General Meeting: Presidential Address: Shellfish interests: bivalves and biomineralisation, followed by Annual Dinner

The next newsletter will be **early December** Copy to me by the **end of November** please. Mary Howie - newsletter@mangeolassoc.org.uk

Views expressed in the Newsletter are not necessarily those of the Association or its Council.