



The
Black
Country
Geological
Society

NEWSLETTER No. 164 April 2004

The Society provides limited personal accident cover for members attending meetings or field trips. Details can be obtained from the Secretary. Non-members attending society field trips are advised to take out your own personal accident insurance to the level you feel appropriate. Schools and other bodies should arrange their own insurance as a matter of course.

Leaders provide their services on a purely voluntary basis and may not be professionally qualified in this capacity.

The Society does not provide hard hats for use of members or visitors at field meetings. It is your responsibility to provide your own hard hat and other safety equipment *(such as safety boots and goggles/glasses) and to use it when you feel it is necessary or when a site owner makes it a condition of entry.

Hammering is seldom necessary. It is the responsibility of the hammerer to ensure that other people are at a safe distance before doing so.

FUTURE PROGRAMME

**Lecture meetings are held at Dudley Museum, St James's Road, Dudley.
Phone (01384 815575)
7.30 for 8 o' clock start unless stated otherwise.**

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Field Secretary
A. Rochelle B.A. Hons.,
Tech.RICS.

SATURDAY 24th APRIL 2004 (Field Trip)

**'The geology of the Longmynd, Priors Holt and the Knills area'
leader; Mike Williams .**

This trip will look at the exotic landscape of the Pre-Cambrian created by the sedimentary and pyroclastic rocks of the district and will conclude with a visit to the Silurian shoreline exposed at the southern end of the Longmynd.
Details from Mike on 01902 822505.

SATURDAY 15th May 2004 (Field Trip)

**'The glacial and post-glacial features of Eastern Shropshire'
leader Andrew Rochelle.**

Meet at Car Park at GR: SJ 744 194
The walking is easy, but strong shoes are recommended
OS 1:50000 Sheet 127 is useful.

Members should be aware of the special nature of the Aqualate area, should obey the country code and have respect for the peace and quiet of this very special area. (The area is an SSSI and a permit is required from English Nature for the visit).

Members will study the ice sheet geomorphology of the area including, peat subsidence through modern drainage, vestigial peat mosses, post ice sheet lakes, erratic boulders, a kettlehole lake, a glacial overflow channel, kames and eskers, former lake shores and the remains of an iron age boat.

A good lunch is available at the Junction Pub on the Shropshire Union Canal at Norbury or a packed lunch should be taken. Two years ago the society visited the area, the weather was wonderful, and coincided with the flowering of bluebells. This visit should see the same phenomenon and should not be missed.

Detailed Itinerary

	<i>Miles</i>	<i>Minutes</i>
Meet at The Canal Warehouse, Newport. GR: SJ 744 194. (TOILETS)	0	0
A518. Shrops/Staffs border. Note meadows and subsidence along road to Meretown. Stop at NO Parking on hill. Views across moors	6.4	20
Meretown Court layby. Views of moors. Glacial deposit near road.	7.1	25
Forton Windmill. Note vestigial lake area. Moors. Saucer shaped area.	8	30
Loynton Glacial Boulder.	10.2	35
Loynton Moss Kettlehole Lake.	12.2	50
Norbury Glacial Boulder.	12.8	55
Norbury Junction Glacial Boulder.	13.7	60
LUNCH AT JUNCTION PUB (TOILETS)		
Gnosall Glacial Meltwater Overflow Channel.	15.5	135
Sandy Bank viewpoint. Saucer shaped area. Relict glacial lake.	17.2	140
Weaver's Hill Kame.	19.2	145
Study till fabric.		155
Guild of Monks. Bluebells. Study Eskers, relict lake shore.		
Note position of unexcavated Iron Age Boat at Aqualate.		
Return to Newport. (TOILETS)	23	200

SATURDAY 26th JUNE 2004 (Field Trip)

'Journey into the heart of a geosyncline' Leader Mike Williams

This trip will take in the scenery and geomorphology of the Elan Valley, into the upper Yswyth valley and across Parsons Gorge to look at fossiliferous rocks and finishing in the turbidite sequences around Aberystwyth.

Important note

It is our intention to provide minibuses or coach transport for this excursion so that everyone can enjoy the benefits of not having to drive, and some camaraderie. We also intend for the society to subsidise the cost of this. As such we need to know names of anyone interested so that we can arrange appropriate transportation.

THURSDAY 2nd – SATURDAY 4th SEPT 2004 (Conference)

UKRIGS Annual Conference at Dudley.

This year the UKRIGS conference will be held in Dudley. Its primary themes will be 'Urban Geoconservation' The application of engineering expertise to conserving and managing geological sites, and 'The use of audio visual, film and the media to bring the geological story of local sites to the widest possible audience'. As usual it will be a programme of indoor talks and presentations with field trips to local sites and social gatherings. For those of you who have never been to one of these conferences and experienced what is going on across the UK to make geological sites more accessible to visit and enjoy, this is the best chance to test the water.

SUNDAY 12th SEPTEMBER 2004 (Field Trip)

'The Woolhope Dome' joint Meeting with Woolhope Naturalists field Club

This is a joint meeting that will look at the Silurian geology and fossils of the Woolhope Dome and the Mortimer Forest. It will be lead by the Woolhope Naturalists Field Club and will feature some very nice fossils and a welcoming pub stop!

MONDAY 27TH SEPTEMBER 2004 (*Provisional Indoor Meeting*)

'Red Beds. Decoding Geomagnetic and Astrophysical Data' by Peter Turner, Birmingham University. (*Details and date to be confirmed*)

MONDAY 25TH OCTOBER 2004 (*Indoor Meeting*)

'The geology, mineralogy and palaeontology of the Coseley Coal Measures Ironstones' by Laura Braznell, University of Birmingham.

Laura is a PhD student currently researching the conditions that gave rise to the spectacularly preserved soft-bodied fossils in the ironstone nodules of Coseley and similar material from other famous locations like Mazon Creek, USA. Specimens from the collections at Dudley will be on display for the evening.

MONDAY 29TH NOVEMBER 2004 (*Indoor Meeting*)

Members evening of short talks and demonstrations

This evening has proved to be very popular in previous years and will again be open to anyone who would like to share something of interest, whether it be some rock or fossil specimens collected on holiday or a short talk accompanied by a few slides. We will provide refreshments as in previous years to make the evening a very sociable one.

PROVISIONAL INDOOR MEETINGS

There are several indoor meetings 'in the pipeline'. Gordon Hensman will confirm the exact details and dates later. They include:

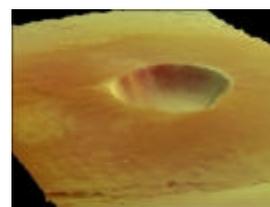
- 'Gold Exploration' by Tim Colman of the BGS.
- 'The Age of the Earth – The Story of the Discovery of Geological Time' by Professor A.D. Saunders, University of Leicester.
- 'Life in the Triassic in Britain' by Dr. G. Warrington of the BGS.
- 'The Deep Geological Structure of the U.K. and Europe' by Dr. Alfred Whittaker of the BGS.

EDITORIAL

There was a great deal in the national press in January concerning the space probes to the planet Mars. The general impression given was that the European mission was a failure because the British Beagle 2 Mars Lander was lost on Christmas Day, whereas NASA was successful with the landing of its Mars Rover. Although Beagle 2 did not function, the superb surface images that were printed in



newspapers and on television, were mostly taken from the European mother ship, Mars Express. This has been a great success for the European Space Agency. Two of the pictures are reproduced here. On the right is an image taken on 23rd January, showing *Albor Tholus*. Wind blown dust is falling over the edge of a caldera, which is 30 km in diameter. The volcano is 160 km wide and reaches a height of 4.5 km. On the left is a



vertical photograph, taken in February, of the highest volcano in the solar system. It is the complex caldera of *Olympus Mons*, which is 24 km tall. The caldera shown on the left has a depth of about 3 km.

Mars Express is now mapping the whole surface of the Red Planet, indeed, when it is finished we will have a better picture of the surface of Mars than we do of the Earth. One of the geologists involved is Dr John Murray of the Open University. He says that the detailed photographic mapping will help in deciphering the geological evolution of Mars. There is also evidence that the Martian ice caps are retreating, and if this is so, it may initiate a rethink of global warming causes on Earth.

The present pictures have a 10 m stereographic resolution, which would mean that you could pick out features the size of houses. This combined with laser altimeter measurements will give a precise imagery of the shape of the landscape, and will enable erosional features to be described.

The above pictures come from the European Space Agency web site, which is well worth a visit at: www.esa.int.

Bill Groves

REPORTS

Gas hydrates- ice and fire

Dr Chris Rochelle, British Geological Survey

Notes about the talk to the BCGS meeting on 23rd February 2004.

The presentation started by describing what hydrates are and where they are found. These white, ice-like solids are made up of small cages of water molecules, each of which is capable of trapping a single gas molecule. Many different gases (such as methane, carbon dioxide, argon etc) can be trapped in such a way. Sir Humphrey Davey first reported hydrates in 1810, but it is very likely that Joseph Priestley made hydrates in his Birmingham laboratory as early as 1778. Hydrates remained a laboratory curiosity until the 1930s when they became a problem for the developing natural gas industry. Since the 1960s they have become increasingly important in understanding natural systems.

Hydrates are found where it is either; very cold and low pressure (such as on the moons of the outer planets or in comets), or cool and at high pressures (such as on Earth beneath the permafrost, or on the bed of the deep oceans). On Earth, methane hydrate is the commonest hydrate, it is found within ocean sediments around every continent, and is even found in the Faroe-Shetland Channel NW of Shetland. Methane hydrate tends to be confined to coastal regions (at water depths greater than 300m), as these are the areas where organic-rich sediments are being deposited, and where shallow gas is being produced. However, methane hydrate is only found in the top few hundred metres of the sediment, as it gets too warm for it to form at greater depths. Some samples of methane hydrate have been recovered from drill core. However, most occurrences of hydrate are inferred from seismic profiles showing a 'bottom simulating reflector' that marks the base of the hydrate zone.

The presentation then went on to describe why hydrates are important. They are a huge potential resource for methane -one that is currently virtually untapped. Indeed, over half of the Earth's organic carbon (estimated at up to 10,000 billion tonnes) may be in the form of methane hydrate, and this resource may be twice as large as all the coal, oil and gas put together. However, extracting the methane presents many challenges. Not only are the hydrate deposits in deep waters or permafrost regions; they are also very difficult to drill into safely.

Methane hydrates can also break down naturally and release their gas. Vast amounts of gas can be released, with 1 litre of methane hydrate being capable of liberating 160 litres of gas. If released rapidly into seawater, it is feasible that the density of the water would be reduced to a point where boats would no longer float. This scenario may be one scientific explanation for the unexplained disappearance of boats in areas such as the Bermuda Triangle. Also associated with methane hydrate breakdown are submarine landslides. If an originally loose sediment was cemented by hydrate and this destabilised, then not only would the sediment fall apart, but it would be lubricated by the water and gas produced. If this happened on the continental slope, then mass movement of sediment could result. There is considerable evidence for many very large submarine landslides in the fairly recent geological past. Interestingly, many of these are at places where methane hydrate is at its most sensitive to small changes in temperature or water depth. Large submarine landslides are likely to produce tsunamis, and there is evidence for such an event off Norway (the Storegga slide) at the end of the last ice age produced a wave that inundated much of the northeastern coast of the UK.

Methane hydrate is also important in terms of changing world climate. As a greenhouse gas, methane is 20 times more effective than carbon dioxide. So if vast amounts of methane were released, then this could warm the planet considerably. This is one natural feedback mechanism that has been put forward for pulling the planet out of the past few ice ages. However, there is also geological evidence that past warming of the planet by 4-5°C as a result of massive volcanic eruptions some 250 million years ago, caused massive methane hydrate breakdown and a further warming of 4-5°C. This 'double whammy' may have caused the Permian mass extinction during which 95% of all living things died. Worryingly, over the past 100 years mankind has warmed the planet by about 1°C through releases of greenhouse gases (mainly carbon dioxide), and this trend seems set to continue.

The end of the presentation went on to show how hydrates might be able to play a role in reducing our emissions of carbon dioxide to the atmosphere, and hence reducing global warming. If carbon dioxide could be captured at large point sources (such as power stations), then it could be piped offshore and injected into suitable rocks to be trapped as carbon dioxide hydrate. The British Geological Survey is currently involved in investigating the potential for this, and other methods of geological sequestration of carbon dioxide, and it is one of the world leaders in understanding the geological aspects of these techniques.

Dr Rochelle works as a senior scientist at the British Geological Survey headquarters in Keyworth, near Nottingham. His primary role is to conduct laboratory experiments to study fluid-rock reactions over a range of temperatures and pressures. As part of this work, he has been carrying out a series of experiments to investigate the formation of gas hydrates within sediments, with a view to understanding how sediment properties change as hydrate forms or breaks down.

Alf Cole

[CONSERVATION COLUMN](#)

Wrens Nest Update -Seven Sisters Siteworks

There is still no change at Wrens Nest, engineering works are still on hold while the bats take their rest for the winter. It is likely that the bats will begin to leave the site in mid to late April and works will commence again.

I am now able to put into the diary the following working party date the collecting side of things at the stockpile locations.

Saturday 8th May 2004, 10am to 12 noon

Dudley Museum Update - Rock and Fossil identification mornings:

In association with the Launch of the 'UnEarthed' gallery I will also be formalising a programme of 'identification mornings' at the museum which will be widely publicised. For your information the following dates will be the first for the new year.

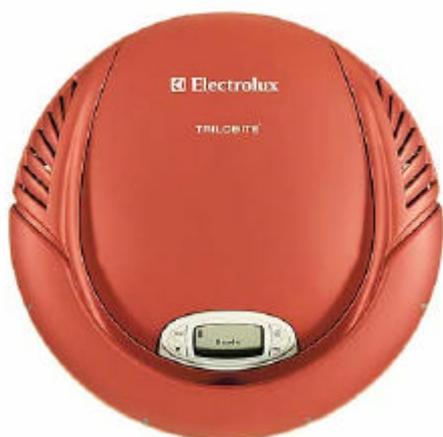
Saturday 22 nd May 2004	10.00 am to 12.00 noon
Friday 4 th June 2004	11.00am to 1.00pm
Friday 30 th July 2004	11.00am to 1.00pm
Friday 13 th August 2004	11.00am to 1.00pm
Saturday 18 th September 2004	10.00 am to 12.00 noon

So, if you have any specimens that you would like identified then please make a note of the dates and times and come along and join us

Graham Worton

GEOBABLE

Remember the remote controlled *TRILOBITES* at the Rock and Fossil Fair? These models are a regular part of the event, where youngsters (and not so 'youngsters'), attempt to steer the Trilobite through an obstacle course. But the idea of a remote controlled trilobite has taken a new twist with the introduction by Electrolux of the 'Trilobite', a remote controlled vacuum cleaner. It will go round the room, using its sensors to avoid furniture and the walls, but cannot do corners, the stairs or curtains. The amazing thing that they should come up with the name 'Trilobite'. It does look a little like a trilobite, (see illustration below), but is there someone in senior management at Electrolux with a geological background?



The Electrolux 'Trilobite' compared with *Olenellus* from the Lower Cambrian.

However, the word 'Trilobite' is hardly a suitable candidate for the GEOBABLE spot. After the AGM it was suggested that the word *FACIES* should be defined. It is one of those terms that is used by all geologists, in a variety of contexts, such as: estuarine facies; eclogite facies and facies fossil, but it is often difficult to define. We are offering a small (very small) prize for a brief definition of the word, and please e-mail or send it to one of the addresses at the end of this newsletter.

Be careful! A student at the start of an A-level geology course was set a small task to find out the meaning of the geological term; *FACIES*. The answer came back: "I think it means dinosaur droppings, and by the way, you spelt it wrong!"

Bill Groves

OTHER NEWS

In the middle of March the newspapers, radio and television were reporting the results of a survey of plant and animal species decline in the UK. The Guardian of March 19th ran it as their main story, under the headline, 'The decline of species...'. The survey found that 71% of all butterfly species had declined in the last 20 years, and the comparable figure for birds was 54% and for native plants, 28%.

This sort of information is not new, and the scientific press has reported the results of similar studies for some time now. For example, a survey in South East Asia last year found that Singapore had lost 28% of its biodiversity in the last 183 years. Facts are very difficult to get from the press releases, as they tend to concentrate on predictions; "*More than 40% of the animal and plant species in South East Asia could be wiped out this century*", and possible explanations linked to habitat destruction by humans, and modification by global warming.

We are likely to be living in the sixth mass extinction since the Cambrian. The other five occurred at the end of the Ordovician, Devonian, Permian, Triassic and Cretaceous periods. The Permian ended 245 million years ago with 95% of all species disappearing, and this was probably the

largest event of its kind. The most well known is the ending of the Cretaceous 65 million years ago when 70% of species were lost, including of course, the dinosaurs. All these extinctions were caused by physical events, and geologists still argue over the relative importance of meteorite impact, super-plume volcanics, sunspot activity, changes in sea level, natural climate change etc. etc. These wiped out whole groups of animals whereas we are eliminating individual species by removing habitats. As one biologist put it, "In the past biodiversity recovered as species spread into new ecological niches, but humans are wiping out niches as well as organisms."

Bill Groves

[CONTACT US](#)

As ever we would love to hear your news and views so please put pen to paper or fingers to keyboard and give us your thoughts. Notices that appear in this Newsletter will remain in future editions until the date of the related meeting or event has passed. In order to include material in the June Newsletter, please send/give it to one of the Editorial Team by **Wednesday 16th June**.

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