



The  
Black  
Country  
Geological  
Society

## NEWSLETTER No. 192 DECEMBER 2008

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.

*Joint Chairmen:*  
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*Field Secretary*  
Andrew Harrison BSC.,  
MSc., F.G.S.

### *In this edition:*

#### **Future Programme**

*Page 2*

#### **Other Societies**

*Page 3*

#### **Meetings report-Whitman's Hill quarry**

#### **Members' Evening**

*Page 4*

#### **Editorial**

*Page 6*

#### **Galapagos**

*Page 7*

#### **Geobabble-Murchison**

*Page 8*

#### **Subscriptions 2009 please**

*Page 9*

**COPY DATE FOR NEXT NEWSLETTER IS  
MONDAY 2<sup>ND</sup> FEBRUARY 2009**

December 2008

*FUTURE PROGRAMME*

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

**MONDAY 26<sup>TH</sup> JANUARY 2009 (*Indoor meeting*)**

**Joint meeting with the Geological Society: West Midlands Regional Group  
North Sea Oil. Speaker: Les Riley (BCGS Committee Member)**

"Bugs and Black Gold; Palaeontology and its role in hydrocarbon exploration and production - examples and applications from the North Sea and Offshore Eastern Canada."

Les has extensive experience as a working geologist in the North Sea Oil Industry, and in many other parts of the world. He will bring us up to date with the latest drilling techniques, and will bring along samples of drilling cores and equipment.

**SATURDAY 21<sup>ST</sup> FEBRUARY 2009 (*Field meeting*)**

**Dudley Museum and Art Gallery, Geoconservation, etc. Leader: Graham Worton**

Meet at the Museum at **10.00am**. The exact itinerary has yet to be formulated but we will be looking at the latest developments in the Museum in the morning, and later in the day we will be going out to see the problems in the Wren's Nest area. Please bring a **packed lunch and outdoor clothing**.

**MONDAY 23<sup>RD</sup> FEBRUARY 2009 (*Indoor meeting*)**

**Natural and Man-Made Earthquakes in the U.K. Speaker: Professor Peter Styles. (University of Keele).**

The Applied and Environmental Geophysics Group at Keele specialise in the application of high resolution geophysical techniques to investigate the region of the earth accessible to and accessed by human endeavour. These techniques include seismology, gravity, radar, magnetic and electrical methods and their computer modelling.

The problems include mining and past mining problems, pollution and its migration, forensic, archaeological and hydrogeological studies. Of special current interest is Clean Coal Technology for energy security and geological studies of Radwaste disposal. The areas of work include UK, Europe, Middle East, Africa and Australia. This talk will also touch on the Dudley Earthquake. The Research Group at Keele consists of 4 academic staff with several others who collaborate in using these techniques in their own research, 8 PhD's and 2 Post-Doctoral Workers

**MONDAY 30<sup>TH</sup> MARCH 2009 (*Indoor meeting*)**

**AGM starting at 7.45pm** followed by:

**GRAHAM WORTON, Keeper of Geology at Dudley Museum and ART GALLERY**

Graham will bring us up to date with what has been happening at the museum and plans for the future. He will tell us about the state of play regarding conservation and development of Dudley's important geological inheritance, such as the necessary stabilisation work on the Seven Sisters caverns, and other features which are in danger.

**MONDAY 27<sup>TH</sup> APRIL 2009 (*Indoor meeting*)**

**The Galapagos Islands. Speaker: Andy Harrison BCGS**

Andy, our field meetings secretary, will talk to us about his recent trip to the Galapagos Islands (Galapagos is Spanish for tortoise), which are so important in Darwin's development of his Evolution by Natural Selection. His meticulous mind was able to discern the sometimes subtle variations between birds and other animals, depending on whichever island they lived. The fructification in his mind of the data he gathered over many years, when he returned to England, eventually led to his theory - despite his reluctance to publish, largely on religious grounds.

Andrew Harrison, Gordon Hensman

December 2008

**OTHER SOCIETIES****GEOLOGICAL SOCIETY: WEST MIDLANDS REGIONAL GROUP****Programme of Evening Lectures**

Lectures to be held on the second Tuesday of each month, alternatively at Birmingham University (Dome Lecture Theatre, Geology Department) and Wolverhampton University; (Room 202, School of Applied Sciences, Wulfruna St ) at 6.30pm (\*unless otherwise stated).

**Monday 26<sup>th</sup> January 2009: Joint Meeting with the Black Country Geological Society**

**Monday 2<sup>nd</sup> February 2009: Joint Meeting with the Midland Geotechnical Society**

Haworth Lecture Theatre, Birmingham University. 7.00pm

Julian Hughes: GIP - Slope Failures on the Severn Valley Railway

**Tuesday 10<sup>th</sup> March 2009:** Wolverhampton University , Room 202, 6.30pm

Ken Addison: Wolverhampton University: Cenozoic landform evolution of the Long Mynd region.

**Tuesday 21<sup>st</sup> April 2009:** Dome Lecture Theatre, 6.30pm. Clive Barnwell: Waterman Group: Offshore Geotechnics

For further details contact the Secretary: Adrian Jones Tel: 0121746 5724 e-mail: [adrian.a.jones@uk.mwhglobal.com](mailto:adrian.a.jones@uk.mwhglobal.com)

**NORTH STAFFORDSHIRE GROUP OF THE GEOLOGISTS' ASSOCIATION**

**Thursday 8<sup>th</sup> January 2009 7.30 pm Speaker: Dr Ian Stimpson, Keele University**

*"The 2004 Boxing Day Earthquake and Tsunami"*

**Thursday 5<sup>th</sup> February 2009 7 30 pm**

**Speaker: Professor David Siveter, University of Leicester.**

*"Silurian soft-bodied sensations: a unique window on the evolution of life".*

**Thursday 5<sup>th</sup> March 2009 7:30pm AGM and Chairman's Address "Shark Bay to Wave Rock".**

Some of the interesting landforms of Western Australia by Elizabeth Hallam.

For further information contact NSGGA Field Secretary <b>Gerald Ford</b> , 01630-673409 or e-mail: <a href="mailto:g.ford@ukonline.co.uk">g.ford@ukonline.co.uk</a>
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For contact with the <b>Field Secretary</b> on the day of a field trip the mobile phone number is 07789 826807 when there is a chance that it will be switched on
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**WEST MIDLANDS OPEN UNIVERSITY GEOLOGICAL SOCIETY**

**Saturday 31<sup>st</sup> January 2009: Day of Lectures. The Dome Lecture Theatre, University of Birmingham.**

Dr Chris Carlon : Vice President of Anglo-American: Mining the Ocean. The Geology, Exploration and Mining of Diamonds and Gold from the Seafloor – the Final Frontier?

Dr David Bond – Leeds University

The Emeishan flood basalts and their role in the late Guadalupian mass extinction

Dr James Wheeley – Birmingham University

Observations on Ordovician Oceans: An overview of some recent Ordovician Research

Dr Clare Warren – The Open University

Up and Down the Escalator: Continental Collision and Exhumation of Ultra-High-Pressure Rocks

Dr Fred Witham – University of Bristol

Volcanic gas emissions as indicators of volcanic behaviour and hazards

The Earth Heritage Trust in Herefordshire & Worcestershire will also be attending to display and talk about the Trust's current work and projects.

There will be a nominal charge of £10 per head (£5 for members). Refreshments will be available free of charge throughout the day, however delegates will need to provide their own lunches.

**Booking is essential. To book your place please contact:** Ron Whitfield – on [ronwhitfield@hotmail.com](mailto:ronwhitfield@hotmail.com) (by Friday 16 January 2009)

## MEETINGS REPORTS

### **SUNDAY 26<sup>TH</sup> OCTOBER 2008 (Field meeting)**

#### **Return to Whitman's Hill Quarry and its Silurian Perspective.**

#### **Leader: Richard Edwards (Hereford & Worcester EHT/ Woolhope Naturalist Group)**

Following on from a very successful field visit to Whitman's Hill Quarry in October 2007 BCGS members were offered a chance to once again visit the site by the Hereford & Worcester Earth Heritage Trust. Our leader for the day was Richard Edwards, from the Woolhope Naturalist Group, who told us how he had rediscovered his interest in geology after moving to the Malverns approximately three years ago from a life of academia at the Camborne School of Mines in Cornwall.

On this visit rather than visiting only Whitman's Hill Quarry Richard spent the day showing us the Silurian succession represented to the west of the Malverns, how Whitman's Hill Quarry fits into it all and also the close relationship between the Silurian geology and the present day landscape. Throughout the day we visited four localities examining a diverse range of facies reflecting a variety of changing sedimentary environments over a period of 28 million years.

#### Locality 1 – North Quarry:

We started the day in the car park of North Quarry on the north-eastern end of the Malverns above Great Malvern. Early morning rain soon cleared and with a handful of BCGS members present we split into two cars for convenience. After a brief introduction Richard led us to a well exposed outcrop of the East Malvern Fault. This fault represents a fundamental boundary between two colliding Precambrian terrains, the Wrekin and the Charnwood, along which reactivation from northerly compressional and extensional forces as a consequence of Hercynian (Variscan) movements resulted in thrusting and extension during the Late Carboniferous. These movements also resulted in folding and faulting of the older Silurian sequences and slickenside markings on the surface of the fault plane and fault breccia provide evidence for these movements.

#### Locality 2 – Dingle Quarry

From North Quarry we drove round the northern end of the Malverns to Dingle Quarry. Outside the quarry we saw rocks belonging to the Cowleigh Park Formation, part of the Llandovery Series, comprising basal conglomerate, known as the Miss Phillips Conglomerate, which represented the youngest part of the Silurian sequence seen in the Malverns. Intensely sheared older Malvernian rocks underlie the Silurian rocks at this locality and it is debatable as to whether or not this contact is a fault, unconformity or sedimentary as suggested on the geological map by the BGS.

Looking north and westwards from this Locality Richard showed how the shape of the landscape is formed of limestone ridges (Aymestry and Wenlock Limestone) and shale valleys (Ludlow Shale and Coalbrookdale Formation) including those forming what remains of the Woolhope Dome. On a good day the Devonian Old Red Sandstone Hills of Hay Bluff and Sugar Loaf, South Wales can be seen on the far western horizon.

When the sediments forming the Cowleigh Park Formation were deposited during the late Llandovery, the area is believed to have been at the coastline of a shallow tropical sea encroaching onto a landmass formed of Malvernian rocks. Within the Dingle Quarry we saw Malvernian rocks comprising diorites intruded by pink granite and pegmatite dykes through which a dolerite sill ran at approximately 50°.

December 2008

**Locality 3 – Brockhill Quarry**

From the Dingle Quarry we headed south along country lanes to Brockhill Quarry, just north of Brockhill Farm. This Locality sits at the western end of the Purlieu geological trail described in the Hereford & Worcester EHT – Geology & Landscape Trail Guide for the Wyche and Purlieu. At this locality we observed the youngest Silurian sequences of the day where a transition from Lower Ludlow shales (Ludlow Series) into the Raglan Mudstone Formation (Pridoli Series) around 411 million years ago can be observed. These two formations represent a transgression from a shallow tropical marine facies to a shallow continental facies, possibly shallow brackish lagoons, where the Raglan Mudstone Formation comprises a sequence of interbedded calcareous sandstones and mudstones deposited during cyclic quiet and rough episodes. At the boundary between these two facies a horizon equivalent to the Ludlow Bone Bed occurs and the steep dip of the strata within the quarry results from Variscan movements associated with an emerging landmass to the north.

**Locality 4 – Whitman's Hill Quarry**

From Brockhill Quarry we headed back north along the country lanes to Storridge and parked in the car park of the village hall. On the way up to the quarry Richard pointed out once more the geological influence on the landscape. Here the Wenlock Limestone forms the ridges, the low ground is formed of the Coalbrookdale Formation and both formations belong to the Wenlock Series that sits stratigraphically between the Llandovery Series and Ludlow Series. Again the Wenlock Series represents deposition within a shallow tropical marine environment and in the back wall of the quarry blue horizontal bands of bentonite clay, formed from volcanic ash layers, were clearly visible within the Wenlock Limestone.

After giving us a brief historical account of the quarry and what could be seen here Richard left us to look around the quarry and once again view the boundary between the Wenlock Limestone and the Coalbrookdale Formation, to look at patch reefs and for fossils within the scree littering the quarry floor. Richard was very interested to hear comments and ideas from our members and would especially like to thank Bob Bucki who pointed out that a structure, within the Coalbrookdale Formation, previously identified as spheroidal weathering may actually be better interpreted as a soft sediment deformation structure. He has passed this information onto a structural friend who agrees with Bob's interpretation.

On this visit the resident Peregrines that keep visitors away from the quarry for most of the year round decided not to make an appearance unlike last October. By 16:00 it was time to leave and head back to the cars and the North Quarry. I would like to take the opportunity to thank Richard and the Hereford & Worcester EHT for another interesting and enlightening visit and look forward to the next one.

The next fieldtrip is being organised for mid February 2009 within the Black Country. If any members have ideas for field excursions or fancy leading a fieldtrip themselves then do please get in touch.

Andy Harrison

**MONDAY 1<sup>st</sup> DECEMBER 2008 (Indoor meeting)**  
**ANNUAL MEMBERS' EVENING**

This enjoyable occasion once again started with a buffet and tea and coffee arranged by our Secretary Barbara Russell, and it was some time before we were ready to start proceedings. **Sue Fairclough** had the opening spot and showed us some superb pictures of Iceland. Sue and Bob had toured the whole island and brought back some excellent images of not only the geology but also the ice and snow.

**Les Riley** gathered us around a large coloured map of the North Sea and Western Atlantic and gave us a brief history and prospects for North Sea Oil based on his work there. It was a fascinating mixture of geology, economics and politics. We were even allowed to see and sniff samples of the crude oil. It was a very attractive trailer for his full lecture to us on 26<sup>th</sup> January next.

December 2008

The 3rd talk was given by **Spencer Mather**. He showed us two large quartz crystals, one man-made and the other natural. He'd visited the Philips factory in Eindhoven and was shown how the crystals are made for use in electronic components. He explained how crystals have handedness and natural quartz crystals can show left and right handed structure. The man-made ones have only left handed structure



even without the Skye presentation the evening finished after 10.00pm!

Two third year geology students from Birmingham University, **Chris Broughton** and **Ali Roberts** were to have given the next presentation on their recent field work on the island of Skye.

Unfortunately, incompatible computer technology made this impossible, and their talk is to be postponed to a future meeting. Finally, Les Riley got us thinking with a very entertaining geological quiz. The winner was Andy Harrison, and

The photograph shows from the left: Bob Bucki; Mike Williams; Sarah Worton and Alf Cole

Bill Groves and Julie Schroder

### **EDITORIAL**

This is my last editorial as **Julie Schroder** will be taking over as editor in 2009, assisted by **Chris Broughton** and **Ali Roberts**. Regular members will know Julie I am sure, and Ali and Chris have joined relatively recently and are geology undergraduates at Birmingham University. It has always been my view that although a society such as ours can rely heavily on retired members, we are lucky in having many younger faces involved in our meetings, although perhaps not enough in the 15 – 25 age group.

Being an editor of any journal or newsletter is a peculiar position. Anything you write with your name at the end of it is your own opinion and not that of the society, and so you can say what you like so long as you are prepared personally to defend it. I have always believed that an editor 'edits', so that I have reserved the right to reduce, correct and format contributions to fit in the Newsletter without changing the meaning, unless instructed otherwise. But the key word here is 'contributions', without members sending in thoughts, photographs, articles etc the editors job would be a boring and easy task of producing a two page leaflet. You also need a good proof reader and over the years I must thank my co-editor Sarah Worton for doing just that. I will send the draft to her and it comes back with a message, usually "I have just adjusted a couple of things" and sometimes, "repeated paragraph on page 4" or more embarrassing "Monday May 5<sup>th</sup> is a Thursday" The final result is I believe, an attractive, colourful document, although most of this is lost on the black and white copies that are sent by post.

At the end of this edition is Julie's email address and I hope that you will keep sending your contributions to her and the Newsletter will go from strength to strength.

Bill Groves

On behalf of the society I'd like to thank Bill for all his hard work over the last few years in preparing the newsletter, such an important job. I for one have enjoyed his editorials immensely and look forward to continuing instalments of "geobabble" in the years to come!

Sarah Worton

December 2008

*from ANDY HARRISON*

## HOLIDAY TO THE GALAPAGOS ARCHIPELAGO JUNE 2008 – A GEOLOGICAL PERSPECTIVE



The Galapagos Archipelago is located approximately 1000km west of the coast of Ecuador and is made up of 13 main islands, 6 smaller ones and over 100 islets and rocks. Together the islands cover more than 430km<sup>2</sup> of open water and have a total land area of 7,882km<sup>2</sup>.

The archipelago sits at the northern edge of the Nazca Plate, which as it moves eastwards is subducted beneath South America at approximately 4cm/year. At approximately 100 km north of the archipelago lies a spreading centre separating the Nazca Plate from the Cocos Plate to the north. The

spreading centre is believed to have shifted its position over time and has associated with it a 'Hot Spot' and conventional mantle plume which, currently sits beneath the Nazca plate exactly where the Galapagos Archipelago is located. Eruptions of the mantle plume have resulted in a chain of shield volcanoes the youngest of which Isla Fernandina, in the west, formed less than 700,000 years ago. To the south and east the islands become older, lower in profile and steeper sided weathered and eroded until they finally disappear beneath the waves as sea mounts. The oldest islands are Isla San Cristobal and Isla Espanola at the south eastern extremity of the archipelago.

Between 6th and 13th June 2008 I had the opportunity to visit the Archipelago on a small 8 day and 7 night cruise around 10 islands and rocky outcrops taking in the natural history of each. The cruise started and finished at Isla Santa Cruz and Baltra, at the heart of the Archipelago, and included Isla Santa Fe (Barrington), Islas Plaza (North and South Plaza), Isla Bartolome, Isla Rabida, Isla Santiago (San Salvador), Isla Seymour Norte (North Seymour), Isla Espanola (Hood) and Isla Santa Maria (Floreana).

Islas Plaza, Bartolome, Rabida and Santiago at the centre of the archipelago provided examples of the birth and dynamic nature of these islands. Ancient pillow basalts in the cliffs of the islet of South Plaza indicated a submarine origin for the islet, which was later tectonically uplifted. On Isla Bartolome examples of Phoehoe and Aa lava, lava tubes, spatter cones, extinct cinder cones and thick layers of ash deposits gave the island the appearance of a lunar landscape and provided a glimpse of its formation. From Bartolome to the east could be seen one of Isla Santiago's dominating volcanic peaks (Cerro Inn) – see photo. On one beach of Isla Santiago petrified burst gas bubbles and submerged lava tubes within Phoehoe lava flows were overlain by thinly laminated ash deposits with ripple marks and desiccation cracks indicating that this beach was once submerged and later uplifted by tectonic forces.

Islas Santa Maria and Espanola in the south parts of the Archipelago were lower lying and looked like they had been worn down with time and were generally greener than the islands further north. Occasional outcrops of columnar basalt flows hinted to the origins of the islands whilst cliffs of red and brown crumbling ash and tuff deposits undercut by the sea showed how the islands were disappearing beneath the waves. On one part of Isla Espanola steep cliffs gave way to a wave cut basalt platform at the edge of which a blow hole would occasionally release an explosive jet of sea water. Off Isla Santa Maria a disintegrating cinder cone called the 'Devils Crown' provided an excellent spot to snorkel and view marine life. Of course the Galapagos Islands are famous for assisting Charles Darwin with his theory on evolution. Stepping foot on the islands it is easy to see why since most of the animal species vary from island to island. In part this is because of the geological processes going on that provide isolated habitats for the species present. Those animals that can swim or fly from island to island show little variation and some choose to live on one particular island and not others. But what about those animals that can only walk and cannot swim? It is believed that during the last Ice Age reduced sea levels allowed for land bridges between the islands over which the animals could travel. Once sea levels rose again the animals became trapped and evolution stepped in to produce new species endemic to each island.

Andy Harrison

### GEOBABBLE

I was looking through some old copies of 'The Illustrated London News' as you do – well it was that or the Daily Mail! In the edition for March 10<sup>th</sup> 1866 I came across this picture of Sir Roderick Murchison. He was 74 years old and the accompanying article was celebrating him being made a Baronet, having been knighted 20 years earlier. It described his early life; he fought in the Peninsular War at the age of 15 and was advised by Sir Humphrey Davy to study science.



In 1831 'he undertook a systematic examination of the older sedimentary deposits in England and Wales. After five or six years' of labour he succeeded in establishing what he calls "The Silurian System"' 'He found a series of fossiliferous primary strata indicating successive oceanic deposits' The article goes on to describe his travels to Norway, Sweden, Russia, Poland and Australia to look at rocks, and lists his many titles, awards, papers and memoirs.

The language used is modern and with no hint of simplification, it assumes that the reader is familiar with the terms 'fossiliferous primary strata' and 'successive oceanic deposits'. However, the picture is intriguing and at the end of the piece is: *Our portrait of Sir Roderick is engraved from an excellent photograph by Messrs John and Charles Watkins of Parliament Street.* These photographers took many famous portraits of famous Victorians; Dickens, Charles Darwin and Richard Owen amongst them. You can still buy posters of these pictures, just 'Google' John and Charles Watkins.

By the way, the autograph that appeared in October's *GEOBABBLE* was that of Sir Roderick.

Bill Groves

### PLEASE CONTRIBUTE

We rely on all members to make the content of the Newsletter more interesting. In order to include material in the February Newsletter, and please send it to Julie Schroder by **Monday 2<sup>nd</sup> February 2009**

*PLEASE SEND MATERIAL FOR THE NEXT NEWSLETTER  
to*

***julieschroder@blueyonder.co.uk***

**Why not have a look at our excellent website at:**

**[www.bcgs.info](http://www.bcgs.info)**

## SUBSCRIPTIONS 2009

Your next subscription is due on **1<sup>st</sup> January 2009**. There has been no increase, please help the society by ensuring all subscriptions are paid before the end of February – thank you.

Please send your subscriptions to the Treasurer:

Mike Williams, The Bungalow, Parkdale West, Wolverhampton, WV1 4TE

SUBSCRIPTION RATES:	<b>Individual</b>	<b>£20</b>	per annum
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