The Black Country Geological Society

Newsletter No. 194
April 2009

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.

Copy date for the next Newsletter is

Monday 1st June 2009

Why not visit our website at: www.bcgs.info

Contents:

Future Programme

Lecture meetings are held at Dudley Museum & Art Gallery, St James's Road, Dudley, DY1 1HU. Tel. 01384 815575. 7.30 for 8 o'clock start unless stated otherwise.

Saturday 25th April 2009 (*Field meeting*) Abberley Hills and Shavers End Quarry. Led by Dr Peter Oliver. Meet at 10:30 at Shavers End Quarry with a sandwich lunch in the Manor Arms pub, Abberley. After lunch there are a number of possibilities: Climb Abberley Hill to see the Haffield Breccia or Walsgrove Hill for the view, or on to Southstone rock or a combination of these depending on time. Other possibilities: Shelsley Beauchamps church and Abberley clock tower. Walking boots and waterproofs required.

Monday 27th April 2009 (*Indoor meeting*) The Galapagos Islands. Speaker: Andy Harrison. Andy, our field meetings secretary, will talk to us about his recent trip to the Galapagos Islands (Galapagos is Spanish for tortoise), which were so important to Darwin's theory of Evolution by Natural Selection.

Sunday 31st May 2009 (*Field meeting*) Castleton Field Trip led by Chris Arkwright. Meet at 10.30 on the abandoned road, close to the entrance to Blue John Mine GR: SK131 833. Finish ~4.00pm. Looking at the Namurian shales and sandstones in the Mam Tor landslide back scarp, comparing the different reef facies in the Dinantian Limestones in Windy Knoll and down Winnats Pass, then to Treak Cliff Cavern for packed lunch (undercover if wet), before visiting Odin's rake to look at evidence of mineralisation and mining and finally walking up the abandoned road pointing out features of the landslip and explaining current monitoring techniques. Bring packed lunch, hard hats and suitable clothing and footwear. Toilets and refreshments are available at Treak Cliff Cavern at lunchtime.

Saturday 27th June 2009 (*Field meeting*) Return to the Brymbo Fossil Forest. Led by Prof Jacqui Malpas. Joint with the NSGAA. Prepare to do some geoconservation work. Details to be confirmed.

Andrew Harrison, Gordon Hensman

Dudley Rock and Fossil Festival

This will take place on **Saturday 19th & Sunday 20th September 2009** at Dudley Concert Hall and Dudley Museum & Art Gallery on St. James's Road, Dudley. It will be open from 10am-5pm on Saturday and 10am-4pm on Sunday. £1 entrance fee per person.

In the Concert Hall: exhibitors from the world of geology, including superb fossil and crystal displays, gems, cut stones, jewellery; face painting, fossil casting and craft activities; a Birds of Prey Display and a T. Rex skull! **In the Museum and Art Gallery:** new dinosaur material, a Darwin exhibition, geologically inspired art and poetry, lab activities, a lecture programme...
Further details can be obtained from Dudley Museum & Art Gallery on 01384 815575.

Volunteers will be needed for the BCGS stand at the event.

Other Societies

Geological Society: West Midlands Regional Group

Tuesday 21st April 2009: Dome Lecture Theatre (Birmingham University, Geology Department), 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

North Staffordshire Group of the Geologists' Association

Wednesday 22nd April: *Downstairs (and Upstairs) at the Potteries Museum, Hanley*.
Leader Don Steward. Meet in foyer at 2.00pm. Due to restricted space in the geology store, limited to 10 places only; please book in with the Field Sec.

Thursday 7th May: *Silurian soft-bodied sensations: a unique window on the evolution of life.* Speaker: Professor David Siveter, University of Leicester.

Thursday 28th May: *British Gypsum Mine at Fauld Lane, Fauld.* Leader: Noel Worley. Meet at Fauld Mine at 9.00 AM (Mine entrance at SK182287 on Fauld Lane between Coton in the Clay and Tutbury).

For further information contact NSGGA Field Secretary **Gerald Ford,**
Tel. 01630-673409 or e-mail: g.ford@ukonline.co.uk
Note: a field fee of £2.00 per head is made (for members and non members).

Woolhope N.F.C - Geology Section Programme

Sunday 19th April: Excursion to some of the classic Llandeilo sections. Leader Dr John Davies Meet at the Castle Car Park by the Castle Hotel in Llandovery at 10.30am. Bring a packed lunch.

Sunday 17th May: The first True Silurian: in the footsteps of Murchison. Leader Duncan Hawley. Meet at the Lay-by next to Trericket Mill on the A470 between Llyswen and Erwood. (GR SO 113 414) at 10am. Bring stout footwear and packed lunch.

Visitors are usually welcome but will need to pay a small temporary membership fee on the day. For further information: contact Sue Hay on 01432 357138 or email svh.gabbros@btinternet.com

Field Meeting Report

Saturday 21st February 2009: Trip to the Dudley Museum & Art Gallery and a tour of the Wren's Nest to update on developments there. Led by Graham Worton, Keeper of Geology and former chairman of the BCGS.

Several society members met in the new dinosaur exhibition hall and Graham gave us an introduction to the origins of the Black Country Geological Society, the Dudley Museum and Art Gallery and its collections. A combination of local geological interest, mining and quarrying led to the founding of the earliest geological society in the UK - The Dudley and Midland Geological Society in 1842 and the formation of a local collection, encouraged by Sir Roderick Murchison who realised the importance of Dudley and the local rocks. After its decline in 1867, The Society was reborn as the 'Dudley and Midland Geological and Scientific Society and Field Club' in the late 1880's and by 1903 the geological collection had passed into the ownership of the Local Authority. A decline in coal mining and mine workers moving away from the area meant much of the collection was sold to institutions like the Natural History Museum and Birmingham University and what remained was stored in Dudley, in a local malthouse.

The existing museum building started life as the local town hall and council library. This was later moved across St James Road, freeing space for the remains of the local collection. In 1912 a catalogue of the remaining local collection was produced by a student of the Lapworth Museum and the local Council established a Museum of Geology, which was opened by Charles Lapworth and lasted through the war years. In 1956 the world's first geological reserve was founded at Wren's Nest and the local Council was encouraged to establish a permanent geological exhibition at the museum. Consequently the original local collection grew. ►

In the 1970's and 1980's members of the BCGS set about saving the local collection, getting it properly stored and catalogued in the museum basement. Following a visit from the curators group of London, it was decided that the local collection, now housed in Gallery 8, should be kept in Dudley and a post of 'Keeper of Geology' established. Colin Read was the first Keeper of Geology at the museum and his insight and enthusiasm established the first temporary geological exhibition at Dudley museum in 1988 called 'Dinosaurs'. This brought the subject of geology to the notice of local people and school children.

Next, Graham took us on a tour of the museum. Today, space and funding are the main controls on the appearance of the museum. The loss of the museum's first time trail in 2004, to dry rot, started a trend of reorganisation to create new space. After fighting the council to prevent this newly created space from being made into a tourist information centre, Graham and the museum staff transformed it into a ground floor gallery dedicated to general geology, and the importance of Black Country geology in particular. Displays have been created as economically as possible, in-house, making the best use of limited space, so only the most eye catching specimens are exhibited. Over 1500 specimens are on show in the museum, which acts as an important source of education. The museum still relies on the support of the BCGS and our own Spencer Mather has played an important part in providing a display of precious gemstones. Graham told us of his intention to recognise members of BCGS and others who have made important contributions to the museum, by adding their names to the displays.

A recent acquisition of storage and research space at Himley Hall, has enabled museum staff to empty old storerooms and open up new galleries, increasing the number from 4 to 9. Gallery 3, formerly the old specimen store, now contains temporary six week exhibitions. Later in the year it will house a display dedicated to Charles Darwin planned to coincide with September's Rock and Fossil Festival. The old storeroom above Gallery 1, formerly housing some 1500 canvasses, is being opened up as a new education room. Upstairs, Gallery 8 houses the remaining local collection and various Quaternary exhibits including a full scale Woolly Mammoth. This gallery is being dedicated to climate change. On the opposite side of the corridor a former office provides a space dedicated to showcasing accumulated research and demonstrating research techniques to the public. Graham intends that the role of the museum should be to continue to popularise and publicise geology to the general public.

Graham showed us the basement office, previously the workshop, but now a board room and store room housing a technical library and Black Country mining archive, being put together by Graham. Here he told us about his involvement with the WROSNE Project in July 2008, which helped the youth living around Wren's Nest to develop socially with an appreciation for what is on their doorstep. As a result of this project levels of vandalism on the reserve, crime and infighting on the two estates appear to have fallen.

Following on from the disappointment of the Big Lottery Fund, two main conservation projects are commencing on the Wren's Nest. The first is called 'Ripples Through Time' and involves clearing out upper caverns of the Seven Sisters and installing a walkway, railings and visitor centre. The second project involves stabilising the Cathedral Cavern and the 220 foot Step Shaft. The gallery has remained untouched for 150 years and requires quick and careful work to stabilise and preserve it.

After lunch we met at the Mons Hill Campus on the Wren's Nest Nature Reserve. Graham took us round the reserve and told us about new additions to the geological trail and measures to improve access and public information whilst reducing vandalism, in accordance with the requirements of the Heritage Lottery Fund.

Society members wishing to volunteer their services to help with these projects, once work starts, should please contact Graham. Meanwhile I would like to thank Graham for his time and for a very interesting visit to the home of the BCGS. ■

Andrew Harrison

If you have not yet renewed, please send your subscriptions to the Treasurer:
Mike Williams, The Bungalow, Parkdale West, Wolverhampton, WV1 4TE
Rates: Individual £20, 'Family' £30, Full time student £5, Group/ Company £35

The Dudley Bug

Welcome

Hello and thank you for the comments regarding our first section, we were pleased to hear how much everyone liked it. This time round we are going back to the formation of the Earth and have included another Word Search along with the answers for the Earthquake one (Issue 193). Any comments and suggestions for topics to include here will be very welcome.

Chris and Alison

Origins of the Earth

As we all probably know, the Earth was formed during the Hadean period dated at 4.56 billion years before present (BP). The way in which we can date the Earth is by studying meteorites derived from the asteroid belt. Almost all meteors have been dated around 4.4 – 4.6 billion years BP. Moon rocks have also been dated as 4.5 – 4.4 billion years BP. This suggests that most bodies in the solar system were formed at approximately the same time.

A model for the formation of the Sun, proposed by Kant (1755) states that interstellar clouds of dust and gas, known as a nebula began to collapse possibly due to a nearby super nova. The spinning disc contained >90% of its mass in the centre. Heat was released due to the collisions between particles and release of gravitational energy. The increased heat promoted nuclear fusion, and this was the beginning of the Sun. The remaining particle disc continued spinning; the particles began to stick together by a process of accretion. The heat energy released caused differentiation between the core and the mantle and a temperature of 20,000°C throughout the early Earth. The surface of the Earth contained a mixture of iron, sulphur and silicates at 960°C.

During the period of formation there were many collisions of planetesimals, reducing the total number to the present day 8 (not Pluto) in the solar system. This is believed to be how our Moon came to being, by a gigantic collision between Earth and **Thea.** Thea was about the size of Mars**.** Our Moon is unique because of its large size (25% of the Earth) and low density. The crust is composed of Anorthosite on the pale highlands, with a thickness up to 100km, with basalt up to 2km thick forming the darker lowland regions. The rock types indicate that mostly mantle material was ejected and accretion condensed the particles into the Moon.

This is a very brief overview of the origins of the Earth and Moon. The basic theories are covered but further references can be provided upon request in the next issue.

Note Regarding the Last Dudley Bug

We received a query about what M_L meant from our section in the last issue. M_L is the Richter local magnitude. This is used when trying to define the intensity of a local earthquake, which can in fact be up to 600Km away. Basically it is the localised effect of an earthquake such as the amount a building shakes etc. This is a scale which the BGS frequently use when locating and describing UK earthquakes. For more information see:
http://www.earthquakes.bgs.ac.uk/earthquakes/education/faqs/faq15.html

Next time in the Dudley Bug

The status of the Plio-Pleistocene Boundary and the Quaternary. Will the boundary be moved to 2.6Ma? Plus the answers from this issue's Word Search.

Origins of the Earth Word Search

Can you find the following 10 words in this word search? They run vertically, horizontally and diagonally and can be found backwards too! Good luck. The answers will be in the next newsletter.

- •Accretion
- •Anorthosite
- •Chondrite
- •Core
- •Hadean
- •Mantle
- •Nebula
- •Orbit
- •Planetesimal
- •Supernova

B	F	Y	K	L	X	C	H	O	N	D	R	I	T	E
C	H	L	T	H	S	C	Y	R	H	B	N	O	A	B
P	C	D	F	T	A	P	O	L	B	T	T	D	A	H
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A	M	B	P	S	U	P	E	R	N	O	V	A	W	S
N	H	R	H	A	V	Y	E	A	L	J	H	C	S	C
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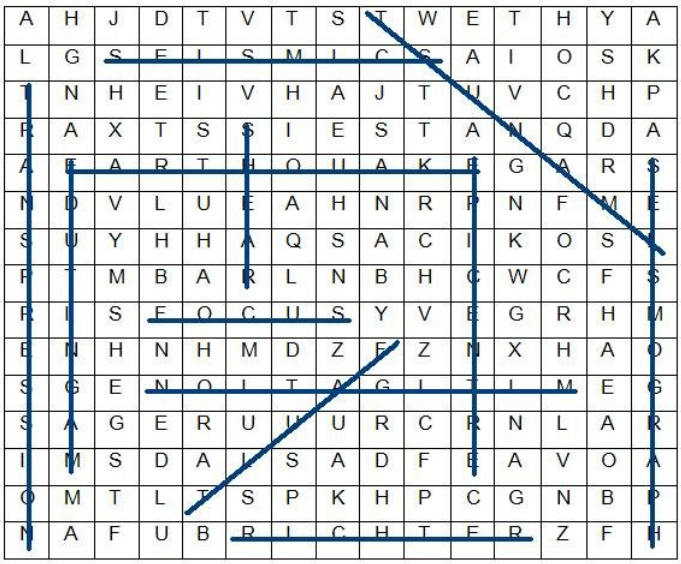
Earthquake Word Search

Answers from Newsletter 193



Editorial

Rescue and Regeneration at the Wren's Nest

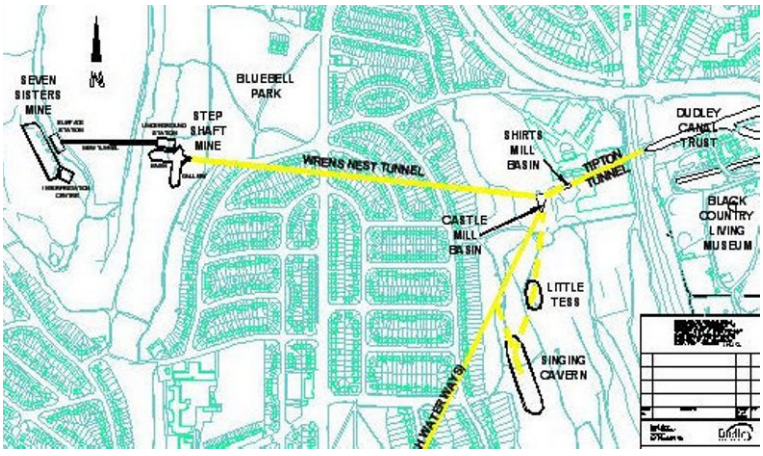
Not only does the Black Country boast some of the country's finest geology and industrial archaeology, but it is currently blessed with a team of visionary leaders with far reaching plans to lift the area out of its post-industrial decline. An ambitious programme of conservation and regeneration was devised several years ago, and given a major boost in 2007 when the 'Black Country Urban Park' reached the final 4 in the People's Lottery competition, with a prize of £50m. Central to the lottery bid was the 'Strata' project to renovate the Wren's Nest and associated limestone mines. Coming 2nd in a 'winner takes all' competition was a bitter disappointment, but the 'Strata' vision lived on, thanks in no small measure to one of its creators and tireless champion, Graham Worton, Keeper of Geology at Dudley Museum and Art Gallery.

Graham has kindly given his time recently to bring BCGS members up to date with developments at the Museum and Wren's Nest, in a field visit *(see Andy Harrison's report above)* and at an indoor presentation. Those of us who were present at these events could hardly fail to be inspired by the mind boggling scope of the Strata project, and Graham's indomitable determination to see it come to fruition.

The Background and Vision for the future

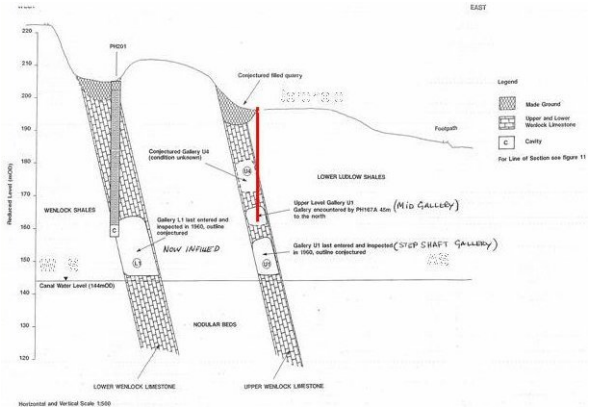
Most of our readers will need no introduction to the geological importance of the Wren's Nest. In a nutshell, the story starts in the Silurian period with the deposition of the Wenlock limestones, which were later folded, and outcrop at the Wren's Nest and Castle Hill. This rock has been exploited for centuries, but more intensely from the late 17th century and throughout the industrial age until demand dwindled in the 20th century. The mines and quarries closed in the 1920s leaving a vast labyrinth of underground tunnels, caverns and interconnecting canals between Castle Hill and the Wren's Nest. The geological importance of this legacy was quickly recognised, and in 1956 the Wren's Nest became the first geological National Nature Reserve.

In the 1960's subsidence and collapse necessitated some strategic infilling of caverns. Part of the canal network to the NE of the Castle Hill ridge was restored and opened to the public in 1973 by the Dudley Canal Trust. This currently leads to the 'Singing Cavern', but the 'Strata' vision is to link the current network from a new canal side centre at Todd's End, via the restored Wren's Nest Tunnel to the largest underground canal basin in the UK - and probably in the world - dating from 1800 -1805. It lies deep below the eastern flank of the Wren's Nest hill, close to the vast Step Shaft gallery (also known as the 'Cathedral Cavern'), which towers to a height of 20m. (see diagram, above). The spectacular Upper Wenlock formations, including ripple beds and a wealth of fossil bearing strata, would be illuminated, and there would be access to a higher gallery, the 'Minstrel's Gallery' for further stunning views.



From here there would be an inclined lift to the Seven Sisters mine in the Wren's Nest Nature Reserve at the surface. This in turn will have been restored and re-opened, with an interpretation centre and learning facilities. ►

The reality for the Step Shaft Gallery

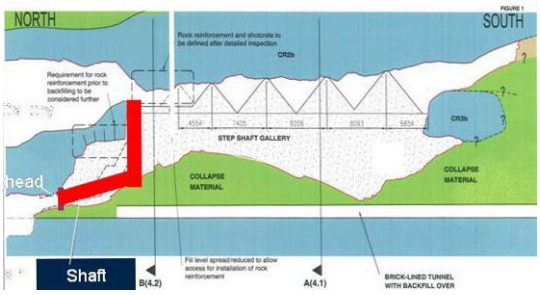


In 2007 it became clear that the Step Shaft gallery was unstable, with the possibility that it might collapse completely within a few years. Immediate action was required, and Dudley Council agreed to a stabilisation plan which will at least spare this amazing hidden gem from the fate of the much larger cavern in the Lower Wenlock limestone to the west, now filled with concrete (see diagram, right). The cavern will be made safe without destroying the geology and archaeology. This will be done by drilling a 250/300mm vertical borehole into the gallery roof, and injecting approximately 3000m^3 of clean sand mixed with water. This can be moved around, and pumped out when/if resources become available to complete the project. There will be some rock reinforcement with 'shotcrete', and an access tunnel constructed to the 'Minstrels Gallery' (see diagram, below).

10 day window for scientific research

This work is due to start in May 2009, but the exciting news is that scientists are to be allowed access to record as much data as possible in a 10 day 'window of opportunity' before the stabilisation work begins. There will be luminaries from the worlds of engineering, geology and archaelogy, with strong representation from Birmingham and Keele universities, and Graham Worton very much to the forefront of the geology team.

Access for the engineers and scientists is in a make-shift lift via the Step Shaft, which originally



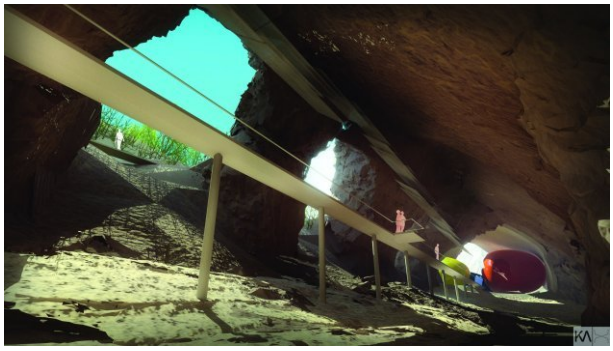
housed a spiral staircase. Preliminary investigations have revealed that the Wren's Nest Tunnel is in excellent condition, though the water level is currently too high. Some of the original steps are still in place at the bottom of the Step Shaft, along with the original timber walkway at the side of the basin. Earlier this year a borehole revealed that the highest of the 3 galleries (see diagram, above) was crumbling, but that the middle gallery (the 'Minstrels Gallery') was stable, with no collapsed material blocking access into the Step Shaft Gallery.

During these 10 days, there will be feverish activity to undertake an archaeological dig, log the exposed geological formations in detail, collect macro and micro fossils, and numerous samples for subsequent scientific research and analysis. In addition to this, interesting geological features will be replicated using a special solvent-free resin. Preliminary tests using this technique have produced excellent results. There will be a complete photographic survey of the mine, and a laser camera will produce 3D images to create a virtual tour of the cavern. This will later be displayed at the Dudley Museum and Art Gallery.

Finally, the entire rock surface will be covered with geotextile to protect it from damage, particularly staining, from the sand. The stabilisation will take about 16 weeks to complete, and then the cavern will sleep, and wait...

A Face Lift for the Wren's Nest and Seven Sisters Mine

There is more positive news for the Wren's Nest. After the failed People's Lottery bid, Dudley Council reverted to a phased approach for its 'Strata' vision, focussing on the Wren's Nest NNR and in particular the Seven Sisters Mine. A proposal called 'Ripples through Time' was submitted to the Heritage Lottery Fund, and in September 2008, nearly £800.000 was secured for the first phase of the project. ►



Long term 'Strata' vision for the Seven Sisters

Although the Seven Sisters is a Scheduled Monument which formerly had public access, rock falls over the last few decades made it increasingly unstable and the area has been fenced off for the last 7 years After stabilisation to make the caverns safe again, access will be re-established, walkways and viewing platforms installed, and an interpretation and education centre built inside the cavern. There will be outreach programmes, a website, downloadable learning packages (including podcast), guided walks, talks and special events.

Extending beyond the Seven Sisters, entrances, paths, steps and fencing will be renovated, with improved access throughout the NNR. There will be site-wide interpretation through robust panels. A Learning and Community Development Officer will be appointed to develop the education programme, encourage volunteers, and help establish a Community Partnership Group, with particular emphasis on encouraging the involvement of local young people.

These are exciting times for the Black Country, and through these pages I will try to keep you up to date as events unfold. We must try to share Graham's unflinching optimism that the full 'Strata' project will be completed in his lifetime. ■

Julie Schroder

Acknowledgements and further reading:

Graham Worton: photos, diagrams and data
Dudley Council web site news: 18th and 26th March
Geological Society, Geoscientist Online: 'Wren's Nest Feathered'.

Some Thoughts on Darwin

Part 2: The Influence of Erasmus Darwin and Geology on Darwin's theory

Erasmus's Contribution

Darwin's grandfather, Erasmus, was a great influence on his grandson, having written several volumes such as 'The Loves of Plants' in 1789, and 'The Economy of Vegetation' in 1792 (often called 'The Botanic Garden'). In 1794 he published Volume 1 of 'Zoonomia', setting out his ideas on evolution.

Erasmus Darwin, 1792

In his publications, Erasmus detailed evidence for the slow change of species in the past, and drew attention to the way both plants and animals had been changed by human beings, eg: breeding race horses, and improving crops by artificially selecting the ones with the most desired characteristics.

He also surely preceded his grandson when he wrote in 'Zoonomia', " ...some birds have acquired harder beaks to crack nuts, as the parrot. Others for the softer seeds of flowers, or the buds of trees, as the finches... " Charles Darwin is well known for his work on birds such as finches, describing how they differ in accordance with their adaptation to different environments.

Also in 'Zoonomia' Erasmus wrote the following: " Would it be too bold to imagine, that in the great length of time since the earth began to exist, perhaps millions of ages before the commencement of the history of mankind, would it be too bold to imagine, that all warm-blooded animals have arisen from one living filament, which the great first cause endued with animality, with the power of acquiring new parts, attended with new propensities... " ►

His book, 'The Temple of Nature' was published after his death in 1803. It told, in verse form, how life evolved from a microscopic speck to the tremendous diversity of species today. He agreed with the Frenchman, Jean-Baptiste Lamarck, that the mechanism for evolution was acquired characteristics. He also continued to believe, perhaps with growing scepticism, in the prime mover, or creator, God. Once God had started everything, he did not interfere. His grandson had similar beliefs, until (as seems likely) late in life, when he stopped going to church.

Charles Darwin was clearly influenced by his grandfather's writings and ideas. It remained for him to use a life-time's observations and studies to develop his theory published in July 1859: " On the Origin of Species By Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life. "

Geological Influence

It was in the late 18th century and 19th century that the new science of Geology developed, and it had much influence on Darwin's ideas. James Hutton, from Edinburgh, developed the idea that the earth needed no act of violence, such as the biblical flood, to explain its origin and development, for it was clear that with enough time everything we see around us can be explained by natural processes. He had developed the principle of 'Uniformitarianism': " ...we find no vestige of a beginning – no prospect of an end. " This was in contrast with the other two contemporary theories of 'Neptunism' and 'Catastrophism'.

Another Scot, Charles Lyell, became known as the 'father of geology'. He became interested in geology whilst at Oxford. William Buckland and William Smith were his mentors. He graduated in 1828, and became a Fellow of the Geological Society. He subsequently travelled extensively in Europe with the eminent geologist, (Sir) Roderick Murchison. Lyell published his 'Principles of Geology' in July 1830, and in 1838 the 'Elements of Geology', the first modern text book on geology.

In Cambridge, Darwin became a close friend of the Revd. Professor of Botany, John Stevens Henslow, and indulged in his Friday evening field trips where they gathered many specimens. Darwin did not have any formal education in natural science, but he considerably impressed some of the most eminent scientists at Cambridge. After his studies in Cambridge, Henslow persuaded Darwin to accompany the Revd. Professor of Geology, Adam Sedgwick to North Wales. This was his only training in geology. He had also received a copy of Volume 1 of Lyell's 'Principles of Geology' which convinced Darwin of the 'Uniformitarian' approach to geology.

This seminal work was acknowledged by Charles Darwin as having an enormous influence on his ideas and his work on the Origin of Species. It is fitting that, as geologists, we recognise how our science shaped Darwin's ideas, and subsequently, the whole of science. ■

Bibliography:

Gribbon, John	History of Western Science 1543-2001: The Folio Society, London 2006
Dickinson, H.W.	Matthew Boulton: TEE Publishing 1999, 1st printed 1936
Darwin, Charles	On the Origin of Species By Means of Natural Selection. 1st Ed. 1859, Fourth Print 2006, The Folio Society C.U.P.
Uglow, Jenny	The Lunar Men: The Friends Who Made the Future 1730-1810 Faber & Faber 2002

Gordon Hensman

Day of Lectures at Birmingham University

On Saturday 31st January a few BCGS members attended a day of lectures at Birmingham University, which was organised by the West Midlands Open University Geological Society. Overall the day was very enjoyable and worthwhile. ►

Nick Schofield was the first lecturer, informing us about his research into how magma is stored and moves beneath the earth's surface. He has been working in the Karoo Basin in South Africa. With the aid of an aerial photograph and 3D glasses we were able to observe finger like structures on the sides of a sill. The conclusions of his research to date are threefold. Firstly, sills form a major part of the volcanic system. Secondly, magma fingers occur when the rock behaves like a fluid and thirdly, using field data alongside 3D seismic data has proved to be a powerful tool in detecting these structures.

The next lecture was by Dr David Bond (Leeds University) entitled *The Emeishan basalts and their role in the late Guadalupian mass extinction.* This research relates to Permo-Triassic mass extinction events in the Guizhou province of South China. The extinction coincides with the onset of explosive volcanism, the evidence for which is seen in ash bed formations and the extinction of the species which occupied this particular niche. The volcanic deposits are unlike flood basalts; they are Mafic Volcanic Deposits (MVD) which were full of gas and explosive, especially when in contact with water. There is evidence of volcanic activity in the sea from pillow lavas, and on land.

After a short break, Dr. Clare Warren from the Open University gave a lecture entitled *Up and Down the Escalator: Continental Collision and Exhumation of Ultra-High-Pressure Rocks*. This area of study examined how material travels from inside the earth to the surface and Clare has been involved in setting up a model to demonstrate the movement.

Following lunch, Dr Chris Carlon, Head of Geosciences and Strategy at Anglo-American plc, gave a lecture about mining the ocean floor for diamonds and gold. Diamonds are to be found on the surface of the desert in the Sperrgebiet coastal region of Namibia. The diamonds have been brought to the surface by igneous intrusions followed by erosion periods which brought the diamonds down to the sea. They were first discovered in 1928 in beach deposits. The diamonds are mined in 100 metres of water 35 km out to sea. Today 350 sites for gold mining are known. In addition to gold and diamond placers, there are many resources in the ocean such as manganese salts, gypsum, halites, titanium.

The final lecture was by Dr Fred Witham (University of Bristol): *Volcanic gas emissions as indicators of volcanic behaviour and hazards.* We were particularly interested in the content of this lecture due to our own experiences with volcanic gases! Dr. Witham drew our attention to many examples of volcanoes and lakes which have caused problems in the past, such as Lake Nyos. Dr Witham taught us was how to make an interesting demonstration to wake people up using a bottle of pop. He demonstrated an earthquake and the escape of various gases. ■

Sue Fairclough

Geobabble

Geobabble has often talked about the origin of geological terms, usually the more bizarre. Fossil taxonomic names are frequently the most interesting, which is why I was pleased to come across a brief study guide; *'Etymology for Palaeobiologists'* by *Leila Battison.* Leila studied geology in Stourbridge and then Oxford and is carrying out research into palaeontology at that university. The classical derivation for fossil names is well known and quite logical, for example *Belemnite* comes from the Greek *belemnon,* dart or javelin shaped. *Orthoceras* also has Greek roots; *orthos* – straight and *keratos* – horn. Many names end in *ites* which is Greek for *connected with,* so when used with *halys,* meaning 'chain', we get *Halysites,* the chain coral. Likewise, *Favosites,* another common coral in the Wenlock limestone is derived from *favorum,* meaning 'to show support'; but hang on, isn't *favorum* Latin? It certainly is; the Victorian geologists, so strict about the names being classical sometimes mixed Latin and Greek. Explore some derivations yourself; Leila recommends the Online Etymology Dictionary on www.etymonline.com And what about the Dudley bug – Calymene? It is from the Greek, kalyptein meaning covered, and mene – moon. ■

Bill Groves

Members' Forum

GEOMAP in the Forest of Dean

Although there has been limited publicity in other publications some members may not be aware of this attraction. This project was the joint winner of the Eni Challenge award presented recently at the GA. The Geomap is a geological map of the Forest of Dean, measuring 30 x 40 feet and is constructed from actual rock types from local operational and disused quarries..

The project is the brainchild of The Forest of Dean Local History Society and I visited the site with Chris Darmon (Down to Earth), who was on the judging panel. We were fortunate to meet the organisers from the site and the local geologist involved and so got a first-hand account of the logistics and difficulties in building the map. The project was funded largely by £150,000 from the Aggregate Levy Sustainability Fund.

It is located at the New Fancy View Point (GR 629095), 2 miles south of the Speech House Hotel. In addition to the geology, the map shows the sites of the 102 coalmines, 35 iron mines and 49 quarries, all with their historic and fanciful names. An excellent information board is on site and leaflets are available from the Local History Society.

The visit can be combined (as we did) with a walk round the Soudley Valley Geology Trail, which in about 4km covers 100m years from the Devonian to the Upper Coal Measures of the Carboniferous. There is an excellent, easy to follow guide published by the Gloucestershire Geoconservation Trust.

We had a great day, supplemented by the close sighting of a pair of Peregrines nesting in Shakemantle quarry on the trail. This is a recommended day out for the amateur geologist and armed with the relevant literature there is no need to have a expert on hand. ■

Peter Twigg

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