



The
Black
Country
Geological
Society

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Newsletter No. 203

October 2010

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**Copy date for the next Newsletter is
Monday 6th December 2010**

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

Those wishing to attend field meetings please contact our Field Secretary, Andy Harrison,
mobile: 07973 330706 or email: andrew_harrison@urscorp.com

Monday 18th October (Indoor Meeting) Please note the changed date! Is Man's role in Climate Change significant? Speaker: Colin Knipe (Senior Partner, Johnson, Poole & Bloomer). This is a joint meeting with the West Midlands Regional Group of the Geological Society. It will be a geological review of past climates and the processes that created them, with an eye to understanding what is happening to the climate now. The significance of human activities which add CO₂ to the atmosphere and natural additions of CO₂ to the atmosphere will be discussed and debated.

Sunday 24th October (Geoconservation field work) Moorcroft Wood, 10am-12:30pm. Meet at the Moorcroft Environment Centre, Hawkswood Drive, Moxley, Walsall, WS10 8GB. This is our first opportunity to become involved in a project to bring hidden geology to light, learning as we go about our local geological heritage. Please register your intention to take part with Andy Harrison (*contact details above*) or with Julia Morris (*further details in her item below, p.10*).

Sunday 7th November (Field Meeting) Moorcroft Wood. A guided walk in conjunction with the 'Black Country Living Landscape Community Involvement Programme'. Meet for a **10.00am start** at the Moorcroft Environment Centre, Hawkswood Drive, Moxley, Walsall, WS10 8GB. We will look at the natural history and discuss the many plans that are currently in development. (*Further details in Julia Morris' item below, p.10.*) Please contact Andy if you intend to take part (*contact details above*).

Wednesday 24th November (Geoconservation field work) Wren's Nest: Scrub clearance in the quarry or fossil trench. Details are to be confirmed once it's known how many are interested. Please contact Andy if you would like to help (*contact details above*).

Monday 29th November (Indoor Meeting, 7.00 for 7.30 start) BCGS Members' Evening and Christmas Social. We are now taking offers of short talks and displays for the meeting. Refreshments will as usual be provided in the convivial atmosphere of the festive season. This is the annual opportunity for members to make their contributions: either share your experiences in a short presentation, or bring along specimens, photos etc. for display and discussion.

Monday 17th January 2011 (Indoor Meeting) The new acquisition of the Wenlock Edge quarries. Speaker: Peter Carty, National Trust Countryside Property Manager, Carding Mill Valley. Peter will talk about their plans, and the joint working proposals for Wren's Nest and Wenlock Edge.

Wednesday 19th January 2011 (Geoconservation field work) Wren's Nest: Hedgelaying. Details are to be confirmed once it's known how many are interested. Please contact Andy if you would like to help (*contact details above*).

Monday 21st February 2011 (Indoor meeting) 'An introduction to Glaciers, Ice Ages and the British Landscape.' Speaker: Dr. Richard Waller, Keele University. This will be a modern review of glacial science and our current understanding of Ice Ages, illustrated with some classic British Landforms.

Monday 21st March 2011 (Indoor meeting, 7.00 for 7.30 start) AGM followed by 'Problematic plesiosaurs - a unique group of extinct marine reptiles'. Speaker: Dr. Adam Smith, Natural Science Curator, Thinktank, Birmingham Science Museum. This talk will bring us cutting edge findings about these majestic creatures of the Jurassic Seas. ►

Monday 11th April 2011 (Indoor meeting) 'The Geology of Lundy'. Speaker: Dr. Clive Roberts, University of Wolverhampton. This little granitic island in the Bristol channel is in many ways enigmatic. This talk will outline the geology and examine new radiometric dating suggesting that it may be the last volcanic episode of the tertiary volcanics associated with the opening of the Atlantic Ocean, although it is so far from the more familiar Tertiary volcanics of the Scottish north western islands.

Other Local Events

Saturday 16th October 2010, 10.00 - 4.00pm. Black Country History Day in the large lecture theatre, Arts building, University of Birmingham. Organised by the Black Country Society and the University of Birmingham. The BCGS will be represented by a pictorial display, manned by our members, together with some eye-catching specimens from Dudley Museum. Fee: £17.00 (including refreshments and lunch). Contact Dr. Malcolm Dick, Centre for Birmingham and Midlands Centre History to book a place. Further details on www.historycultures.bham.ac.uk/events/dayschools/

Thursday 4th November 2010, 6.00 - 8.00pm Members of the BCGS have been invited to attend the 'Black Country History' website launch event at Bilston Craft Gallery. (*Details in 'Black Country History' box on p.9.*)

Saturday 16th July 2011. Visit to Dudley by the international scientists of the Silurian sub-commission. The Society will have the opportunity to help to host this visit and meet and greet the overseas delegates.

Sat/Sun 24/25th September 2011. Dudley Rock 'n Fossil Festival. Bigger and better than ever, it will feature the usual host of talks, activities, demonstrations, exhibitors, special exhibitions and traders in everything earth science related for boffins and families.

Other Societies

BCGS members are normally welcome to attend meetings of other societies, but should always check first with the relevant representative. Summarised information for the **next two months** is given in our Newsletter. Further information can be found on individual Society web sites.

Woolhope Naturalists' Field Club - Geology Section

Friday 19th November: The Shetland Experience, coordinated by Dr Geoff Steel. This is your chance to find out about the Shetland Isles, especially their Geology from the group who visited the islands last summer.

Indoor meetings are usually held in the Woolhope Club Room of the Main Library, Broad Street, Hereford, HR4 9AU, starting at 6.00 pm. Guests are welcome, but must take day membership of the Club: £1.00. Further information: Sue Hay on 01432 357138, email svh.gabbros@btinternet.com or visit their web site: www.woolhopeclub.org.uk/Geology_Section/default.htm

North Staffordshire Group of the Geologists' Association

Thursday 14th October: The genesis and evolution of sulphate evaporites in the Midlands by M. Noel Worley (Saint-Gobain)

Thursday 18th November: The Tenth Wolverson Cope Lecture: 'Age of extinctions' by Professor Paul Wignall (University of Leeds). A comparison of the four mid Phanerozoic mass extinctions, including the end-Permian and end-Triassic events.

All lectures are held at 7.30 in the School of Earth Sciences and Geography, William Smith Building at Keele University unless otherwise stated. Further information at: www.esci.keele.ac.uk/nsgga/

Manchester Geological Association

Saturday 13 November at 10:30: The Broadhurst Lectures: Jurassic Seas, Jurassic Skies.

Many MGA members will remember Dr. Fred Broadhurst, who died in October last year. In this day of talks, the MGA celebrates the life and work of Fred, by looking at some topics that he himself was interested in, given by people who knew and worked with him.

Saturday 11 December at 13:30:

The Quaternary of the North West: Professor Peter Worsley, University of Reading

The last Ice Sheet and later Glaciers in Wales: Dr. Phil Hughes, University of Manchester

Moraines and Outwash Plains: Dr. Dick Crofts, British Geological Survey

Glacial Lake Deposits and Reconstructing Deglaciation in NW England: Dr. Cathy Delaney, Manchester Metropolitan University

Meetings are held in the Williamson Building, Oxford Road, opposite The Manchester Museum. There is no charge for visitors from other societies at lectures or field visits. Further information about indoor meetings at <http://www.mangeolassoc.org.uk/> email: lectures@mangeolassoc.org.uk

Shropshire Geological Society

Saturday 23th October: (morning Rockhop meeting, commencing 10.00 am): Stiperstones, to be led by Andrew Jenkinson. Walking (two miles, starting at the Bog Visitors Centre Car Park); some rough ground; bring your own refreshment, if required (booking to reserve a place and obtain joining instructions from Frank Hay, preferably by email: frankhay@waitrose.com; telephone: 01694 724 723)

Wednesday 10th November: Glacial geology. Speaker: Dr Simon Cook, (Lecturer in Glaciology at Aberystwyth University). Lectures are held at Shire Hall, Shrewsbury, 7.15pm for 7.30pm.

Saturday 20th November: (morning Rockhop meeting, commencing 10.00 am): Shrewsbury Abbey, to be led by David Pannett. Walking around the Abbey, looking at building stones; bring your own refreshment, if required. (Book to reserve a place and obtain joining instructions from David Pannett, by telephone: 01743 850 773 or mobile 07986 558 683).

Anyone wishing to attend should telephone the meeting co-ordinator at least 48 hours in advance. A nominal charge is levied for non-members. The Rockhops are primarily intended for beginners. Arrive 15 mins before the start of field trips for admin. Further info at: www.shropshiregeology.org.uk/

Lapworth Lectures

Monday 11th October: Biogeochemical Cycles; Bugs, Bogs and Labs, Dr Rebecca Bartlett (School of Geography, Earth & Environmental Sciences, University of Birmingham)

Monday 25th October: The Virtual Palaeontology Revolution, Dr Mark Sutton, (Department of Earth Sciences & Engineering, Imperial College London)

Monday 8th November: Reconstructing the Solar System's first five million years from the evidence in meteorites. Dr Ian Sanders (Department of Geology, Trinity College Dublin)

Monday 22nd November: Oceanic anoxic events: old problems, new solutions. Dr Stuart Robison (Department of Earth Sciences, University College London.)

All lectures commence at 5.00pm in the Dome Lecture Theatre, Earth Sciences, University of Birmingham. Each lecture is followed by a wine reception in the Lapworth Museum; all are welcome! Further information at: <http://www.lapworth.bham.ac.uk/events/lectures.shtml>

Mid Wales Geology Club

Wednesday 20th October: Landsliding in Wales, Is it a Problem? Dr. Adrian Humpage,
British Geological Survey in Cardiff.

Meetings are held at Plas Dolerw, Milford Road, Newtown, Montgomeryshire, SY16 2EH. Meet at 7.15 for 7.30pm. Further details: Ed. newsletter & Hon Sec: Tony Thorp: Tel. 01686 624820 and 622517 jathorp@uku.co.uk Web site: www.mwgeology.uku.co.uk/

Warwickshire Geological Conservation Group

Thursday 4th November: Lead Mining in the Peak District Speaker: Paul Chandler.

Meeting in the Senior Citizens Club, Southbank Road, Kenilworth. If you wish to attend contact Ian Fenwick swift@ianfenwick.f2s.com or 01926-512531. The WGCG mobile phone (0752 7204184) available on the day from 11.00. There is a charge of £2.00 for non-members. For further information visit: <http://www.wgcg.co.uk/>

Compton Verney Geology Day

Saturday 16th October

An opportunity also to visit the

Compton Verney Exhibition - Volcano: Turner to Warhol.

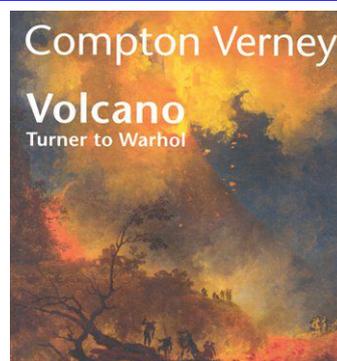
The first exhibition to celebrate the extraordinary artistic outpourings that volcanic eruptions have triggered over the last five centuries.

WGCG Display: 11.00am - 3.00pm

Lecture and exhibition tour - 3.00pm:

'Mountains of Fire: the science and art of volcanoes'.

Dr. Carl Stevenson, Earth Science Dept. Birmingham University.



Venue: Compton Verney, Warwickshire CV35 9HZ. Tel: 01926 645500. www.comptonverney.org.uk

Admission charge: Compton Verney gallery £8.00 (concs. £6.00).

Geology Day: (includes admission and lecture tour) £13.00 (concs. £11.00).

Editorial

I'd hoped for a bulging postbag of items for the Members' Forum after the long summer break, especially from those of you who've had geological holidays. Whilst there's no shortage of material for this edition for which I'd like to thank our regular contributors, it's disappointing that there are no fresh names, and disappointing for Chris and Alison that there has been a rather poor response so far to their photo competition. So please go through your photos - the more the better for the display which they will present at the Members' Evening. Please also help to turn this Newsletter into a mouthpiece for everyone in the Society. Let us know your opinions on meetings, field trips, the Newsletter or any other geological matters, or pose questions for discussion. Items of interest, however short are all important, so please get in touch - it's never too early to send material for the next edition!

Dates for the geoconservation work are now in place, giving us a chance to re-engage with this vital work which played such an important part in the Society's early days after 1975. Alan Cutler and Andy Harrison have been working behind the scenes with Julia Morris to make this happen, and it's up to us now to make it succeed. This is an opportunity to take a pride in our local geology and play a part in its conservation. So please make every effort to join the volunteers at Moorcroft Wood on 24th October, and we'll hope for a nice dry day to make it all the more enjoyable. ■

Julie Schroder

The Dudley Bug

Welcome

Hi! Welcome to the first Dudley Bug of the new 2010/2011 season. We hope you all had a great summer and enjoyed your various trips if you were lucky enough to get away. We hope that you found last issues tips on looking after your collection useful; we have heard a few people say that they are taking our tips on board!

This issue we bring you some important changes to the photo competition which we have been running throughout the summer. We also give you the answers to the last word search on clastic sediments (Newsletter 202) and a bit of information on Volcanic hazards. So sit back, put your feet up and enjoy this issue of the Dudley Bug!

Alison and Chris

Photo frenzy!

The Dudley Bug Geo-photo Competition – now extended.

This summer we held the first ever ‘Dudley Bug’ photographic competition. The aim was to involve as many members as possible and to see the geological environments as an art form as well as a piece of interesting Earth history. Originally the competition closed mid-September but due to the lack of entries we were unable to award a winner. So we have now decided to extend the closing date to midnight on **Friday 12 November 2010**. This gives those of you who didn’t enter and never got around to it to have a go.

This is open to anyone with a camera, whether it is a compact or something more professional plus it’s open to all abilities. The subject of the photo can be anything geology related.

The rules are:

- The photo must have been taken after the 1st June 2010.
- The photo must have been taken in the UK.
- Entries are limited to two images per person.
- No computer editing is permitted, other than cropping the images or for black and white.
- Judging will be by the front of house staff at Dudley Museum.

The images will be on display at the Members Evening in November, and prizes will be awarded to the top three photos. We have already had a couple of entries so get yours in to us as soon as possible.

Please send your entries to thedudleybug@hotmail.co.uk by midnight Friday 12th November 2010 stating your name, photo title, where and when it was taken. Good Luck!

S	E	V	R	A	V	T	F	I	M
H	S	V	Y	S	G	L	O	B	U
A	I	S	C	R	A	N	E	D	
E	K	A	R	Y	S	S	B	N	R
P	F	F	A	N	N	V	A	O	
O	U	L	E	G	R	O	C	F	C
L	C	L	A	S	T	I	C	O	K
C	O	N	E	I	N	C	O	N	E

**Clastic Rock Word Search
Answers from Newsletter 202**

Types of Volcanic Hazard

When we think of volcanic hazards we always think about the obvious ones such as lava flows, ash fall and pyroclastic flows. There are a number of other ways in which a volcanic hazard can form; these include gases, tsunamis, landslides, ballistic projectiles and jokulhlaups.

Lava flows are the most easy to control and avoid. They have only caused <1% of deaths caused by volcanic hazards. Some flows can be very large whereas others confine themselves to a small area. Large flows may cause flow fields which are overlapped lava flows; the largest example is the 1783 Laki Lava flow in Iceland.



*Laki Fissure, Wikimedia Commons,
photo by Chmee2*

Ash flows are formed by two different methods: pyroclastic flows and pyroclastic surges which are both driven by gravity. Pyroclastic flows are full of hot volcanic material and flow quickly down valleys. A pyroclastic surge is a high velocity, quick flow which is not restricted to valleys.

Ash falls are a group which include volcanic bombs (sometime referred to as ballistic projectiles) and ash fall. These are a huge threat to aviation which was witnessed in early 2010 by the Iceland eruption. They also cause respiratory problems because of the fine ash particles. In total approximately 3000 people have been killed due to ash in the last 100 years but these were mainly through roof collapses and respiratory problems.

There are different types of flow which carry debris. Mudflows carry fine debris such as ash and mud. Debris flows are slow flowing because they carry coarse grained material. Lahars are caused by high speed flows full of volcanic debris such as ash. It is important to note here that these flows can occur a long time after an eruption due to changes in weather conditions such as heavy rain or slope failure.

Jokulhlaups are caused by volcanoes which are buried deep below an ice sheet. As the heat from the volcano causes the ice to melt, large quantities of water can suddenly be released. This sudden release of water leads to a lahar. These are common on ice caps in Iceland and North America. The Katla eruption in 1918 caused a flow of 300,000-400,000 cubic meters a second, which is more than 20x the flow of the Mississippi.

Gas hazards are very hazardous because sometimes they are undetectable to a human. The most common gases related to volcanic eruptions are CO₂ (carbon dioxide), SO₂ (sulfur dioxide), H₂S (hydrogen sulfide), HCL (hydrochloric acid) and HF (hydrogen fluoride). In order to monitor these hazardous gases, detectors have been placed within the vicinity of volcanoes which monitor gas amounts.

5% of tsunamis are caused by volcanic eruptions, although most people associate them with large earthquakes. There are a number of different methods in which a volcanic tsunami can form. Firstly, explosive eruptions can cause huge tsunamis such as the 1883 Krakatoa eruption. Secondly, different flows (pyroclastic flows and avalanches) can cause the water to displace causing a tsunami such as the pyroclastic flow caused by the eruption of Mt. St. Helens which led to a 260m high tsunami within Spirit Lake. And finally, the collapse of volcanoes into the sea causes huge amounts of water displacement.

The mitigation of volcanic hazard effects is still an area which requires a lot of research. Although today we can monitor when a volcano is likely to erupt we cannot tell the exact time it will erupt or how big the eruption will be. Different methods of mitigation include seismic monitoring which tests for small earth tremors from the vicinity of a volcano. Ground deformation can be used to monitor magma movement to the surface. This is done by the use of GPS or tilt-meters which are placed on the side of volcanoes. A new technique using magnetics has been developed which measures the demagnetisation of rocks as they begin to melt. Finally, thermal monitoring which looks at the changes in ground temperature in the run up to an eruption. ■

Geology Collections in the Black Country

Geology collections within the Black Country are in most part hidden within the stores of museums, in boxes or storage cupboards, where nobody can see or enjoy them. The only exception is Dudley Museum & Art Gallery which is widely known for its displays on local and international geology. But thanks to a new website www.blackcountryhistory.org the general public can gain an insight into these hidden collections from within the comfort of their own homes. (See 'Black Country History' p.3 for details of launch invitation for BCGS members. Ed.)



Calymene blumenbachii "The Dudley Bug"
A Trilobite from the Dudley Museum
& Art Gallery collection

The Black Country History website brings together the Geological collections from three Black Country Museums. These are Dudley Museum & Art Gallery, Wednesbury Museum & Art Gallery and Wolverhampton Art Gallery. Collectively these collections hold over 35,000 geological specimens. The collections at Wednesbury and Wolverhampton are both closed collections. However, the Dudley collection is still growing and accepting donations. The collective geology collections are larger than any other type of collection within the Black Country, which include fine arts, glass and social history.

Dudley holds between 17,000 and 18,000 specimens and forms the largest of the geology collections. This includes fossils, rocks and minerals. The particular strength of this collection is the Silurian material from the Wren's Nest which contains many trilobites, crinoids and corals to name a few. There is also a large collection of locally sourced Carboniferous material which links with our mining and industrial heritage. Although the strength is on the fossils, the collection contains a large amount of mineral and rock specimens from sites across the UK.

Key collectors at Dudley include Dr. David Ray, an international scientist who has donated many crinoids and trilobites as well as material he has collected from the US. The recently acquired Steven Birch collection donated in 2009 features some rare finds, including a soft bodied worm and a rare type of bryozoan, which Steven found during his many hours at the Wren's Nest. In total he donated over 500 individual specimens from his personal collection. Other key collectors include Graham Worton, the current Keeper of Geology at Dudley Museum & Art Gallery who has an ongoing collection including many minerals and samples taken from recent work at the Step Shaft Mine. The Johnson Poole and Bloomer (JPB) collection features specimens collected during site surveys and workings. Finally, the Steve Powell Collection, a local caving enthusiast, who collected many mineral specimens whilst exploring caves. Within Dudley's collection are some of the most important Silurian specimens in the world. This is because Sir Roderick Murchison used specimens found at the Wren's Nest in his work on 'The Silurian System.'



Quartz with honeycomb structure from the
Wednesbury Museum & Art Gallery collection

Wednesbury Museum & Art Gallery holds 9,000 specimens within its closed collection which was mainly donated by G. Robbins in 1906. This collection is strong on Jurassic and Cretaceous fossils but is also extremely strong on mineral specimens. Within the collection are a number of unusual finds including fossil lobsters and one piece of quartz which has a grid-like, honeycomb appearance. This is due to the limestone in which it formed dissolving to leave the harder quartz structure. ►



Dactylioceras sp. An Ammonite from the Fraser Collection at Wolverhampton Art Gallery

The collection at Wolverhampton contains approximately 9,000 specimens which span the whole geological time scale ranging from Pre-Cambrian through to more recent. This collection consists of specimens which are predominately from the Dr. John Fraser Collection. Dr. Fraser bequeathed his collection to the town of Wolverhampton after his death in 1909; the collection was accepted by the Art Gallery in 1911. Dr. Fraser was a local medical professional with an interest for palaeontology. He became the President of the Dudley and West Midlands Geological and Scientific Society. The main strength of his collection is the fossils, particularly those from the Jurassic, Cretaceous and Cenozoic Periods. There is a large proportion of recent shells which he has collected from trips to France. Smaller collections within the Wolverhampton collection include the Bilston Library Collection and the Tarmac Collection.

Currently the collections at Wednesbury and Wolverhampton have no specialist geology curator to care for them, so many specimens remain un-catalogued and in some cases unidentified, which is a shame because these collections are so important. Over the last year there have been two projects to try and sort out the backlog of specimens. This has included two, two week studentships with students from the University of Birmingham who have helped catalogue the Dudley collection and a twelve week KITTS Placement where two graduate geologists worked across the three venues to get records ready to go onto the website.

The Black Country History website has allowed access to these collections through the internet which can be accessed from anywhere at any time. You can find high quality images of the specimens as well as descriptions about the objects. If you find a specimen which you would like to see for real, there are contact details on the site to arrange a visit to the relevant museum. And don't forget that there are other collections available through the site including art, glass and social history.

A second website www.geologymatters.org.uk is also being developed, dedicated to the geology collections within the Black Country. This will be going live very shortly so keep checking!

If you have a Facebook account why not join us and become a fan: just search for 'Geology Matters.' ■

Alison Roberts and Chris Broughton

Black Country History

A new website www.blackcountryhistory.org has been developed over the last eighteen months which features collections from Black Country museum and archive services. These collections include 119,000+ objects from geology, glass, fine art and social history collections.

Members of the BCGS have been invited to attend the special website launch event on Thursday 4th November 2010 between 6-8pm at Bilston Craft Gallery.

There will be invitations available to collect at the next indoor meeting on 18th October.

Bilston Craft Gallery, Mount Pleasant, Bilston, West Midlands WV14 7LU. Tel: 01902 552507
Web: www.wolverhampton.org.uk/bilston email: bilstoncraftgallery@wolverhampton.gov.uk

Preserving the past at Moorcroft Wood...

Black Country Living Landscape Community Involvement Programme is working in partnership with the Black Country Geological Society to offer volunteering opportunities to help improve and maintain the Black Country's geological features. We hope these volunteering days will highlight the region's geological heritage and engage and educate local people about the wealth of geology in the Black Country.

The first volunteering event will be taking place at Moorcroft Wood Local Nature Reserve on Sunday 24th October from 10am until 12:30pm. We will be meeting at the Moorcroft Environment Centre, Hawkswood Drive, Moxley, Walsall, WS10 8GB and we will be joined by some local volunteers from the Friends of Moorcroft Wood who will help us to remove vegetation from the furnace slag on the site.

There is quite a quantity of furnace slag at Moorcroft Wood LNR and this event is part of a larger event programme to improve the area, but also to highlight the heritage and underlying geology. We are in the process of developing interpretation for the site and focusing on the furnace slag, as many of the site users have no idea what the material is or how it came to be there.

We are also offering a guided walk of the site on Sunday 7th of November starting at 10.00am from the Moorcroft Environment Centre, to look at the natural history and discuss the many plans that are currently in development.

If you would like to participate in either of these events or would like to take part in future volunteering opportunities to help us in protecting and preserving some of the region's geological features, please contact Julia on the details below for further information or to book your place on one of the events.

Please contact Julia Morris, Black Country Living Landscape Community Involvement Programme Team Leader and Liaison Officer for Walsall on 0121 505 4429 or 07791 070895 or email Julia.m@bccl.org.uk or take a look on the website www.bccl.org.uk ■



Have a look at our website at: www.bcgs.info

Field Meeting Reports

Saturday 8th May: Building Stones of Birmingham

Unfortunately due to unforeseen circumstances our visit leader, Eric Robinson, was unable to attend on the day. The morning was wet and cold when a small number of us met at the HSBC bank outside the Pallasades Shopping Centre. Fortunately we had a copy of Eric's trail notes written in 1999 concentrating on Broad Street, Centenary Sq. and Victoria Sq. We also had former BCGS member Paul Shilston's trail notes written in 1994, concentrating on the City centre.

According to Paul's notes, central Birmingham is constructed of stones from various far off places because there's no local source. From the introduction of canals after 1750 and later transport improvements, building stone became a lot easier to source from further afield. Few old buildings in central Birmingham survived the last war or later industrial change and growth. ►

From the HSBC we roughly followed Paul's trail up Cannon Street to Temple Row, the Cathedral, Colmore Row and other small roads. Mylonite gneiss fronts the HSBC, which also has Larvikite (known jokingly as Midlandbankite) doorsteps. At the top of Cannon Street the Bank of Scotland is fronted with Portland stone, which is also seen in the memorial to Colonel Frederick Burnaby adjacent to the cathedral. The Cathedral itself is built of Triassic sandstone, from near Ashbourne, and around it are newly laid sandstone slabs that nicely illustrate Liesegang bands. The buildings of Colmore Row are also built of sandstone. The Grand Hotel has entrance columns of Shap granite complete with xenoliths and other granites can be seen within the entrances to other buildings.



Since Paul wrote his trail several buildings and street layouts have changed, making the trail hard to follow. Wet, cold and confused we found refuge with a hot drink in the Old Joint Stock to look over the trail maps and to formulate a plan. Afterwards we walked past the banks and solicitors of Waterloo Street to the Birmingham Carers' Centre on Victoria Square. These are generally built of sandstone with the odd frontage of granite and larvikite. The doorstep of Waterloo House is Rapakivi granite and the Birmingham Carers' Centre is built of Portland stone, with an oolitic texture, and lower walls dressed with Larvikite.



On Victoria Square the Council House and Birmingham Museum and Art Gallery are built of Darley Dale sandstone (millstone grit) from near Matlock. The Council House is also decorated with Portland Stone carvings of engineers. The Town Hall is built of a Carboniferous limestone from Penmon Quarry, Beaumaris, Anglesey and shows up coral fossils.

With the weather not improving, we decided to have lunch in the Birmingham Museum and Art Gallery cafeteria from where most people decided to call it a day. Outside the Museum a number of examples of limestone and granites can be seen within the Chamberlain fountain, and the statues of James Watt and Joseph Priestly that stand on the steps around the Forum Arcade and library.

I would like to thank the members who came and braved the weather for a still enjoyable day. Also thanks go to Eric Robinson for originally agreeing to lead this visit and for providing his notes, and to the memory of Paul Shilston whose trail still survives.

Saturday 19th June: Buxton Area Volcanics. Led by Chris Arkwright (Open University)

We met Chris and her husband at the disused Railway Station car park in Miller's Dale, east of Buxton, Derbyshire for 10:30 am, on a warm, sunny morning. This visit included four locations that illustrated the relationship between local limestone and associated igneous geology, and the wider regional context. Last year we visited the Mam Tor/Castleton area and saw the geology associated with the edge of a feature known as the Derbyshire Dome. This visit followed on and was geographically located more towards the Dome centre.

Derbyshire's rocks date from the Carboniferous during which tectonic movements caused sporadic, localised volcanic activity that resulted in emplacement and extrusion of basalt lavas, dolerite, tuff and ash deposits intermingled with the various strata. Mapping of these igneous rocks around northern and southern Derbyshire has revealed four main areas of long, stringy, discontinuous bodies issuing from unidentified volcanic centres. ►

Locally, Miller's Dale comprises Lower Carboniferous limestone strata deposited under shallow tropical marine conditions. The following table summarises the sequences and formations involved:

AGE	SEQUENCE	FORMATION
BRIGANTIAN (~330 Ma)	Monsal Dale Limestones	Monsal Dale Beds
		Upper Miller's Dale Lava (UMDL)
		Station Quarry Beds (SQB)
ASBIAN (~340 Ma)	Beelow Limestones	Miller's Dale Beds (MDB)
		Lower Miller's Dale Lava (LMDL)
		Chee Tor Limestone (CTL)

Both the LMDL and UMDL are very mafic and vesicular. Later these formations were affected by dolerite emplacement and hydrothermal mineralisation, which unlike Castleton, is rare in the Miller's Dale area.

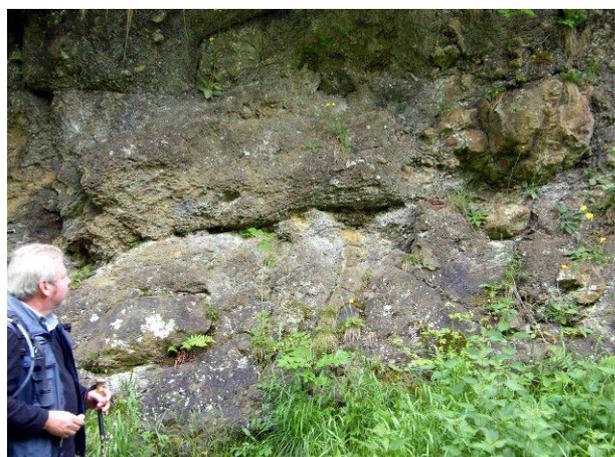
Location 1: Miller's Dale Station Quarry

From the station we followed the Monsal trail, a disused cutting now a public footpath and cycleway, a short distance west from the car park to Miller's Dale Quarry. Here Chris recapped on last year's Castleton visit, the regional geology and its formation. The exposed limestone rocks within the Quarry comprise laminated SQB overlying a thick, dark grey exposure of the MDB, with the boundary between them clearly seen towards the top of the quarry face. The MDB contains few fossils; however we did manage to find some brachiopods and corals.

Two large concrete clad lime kilns adjacent to the quarry were used between 1880 and 1944, to manufacture quicklime for agricultural, chemical and steel industry use. Limestone may also have been quarried for use as a building stone. The top of the lime kilns provided a look at how the surrounding landscape of rounded green and wood covered hills was influenced by the underlying geology, with deep valleys containing small rivers and huddled houses. Across the far side of Miller's Dale Valley we could see flat lying high ground representing the UMDL, which sits stratigraphically higher up than the Miller's Dale Quarry. We continued west along the Monsal trail, which was lined with trees, bushes and wildflowers like clover, daisies and orchids, and limestone exposures encrusted with red lichen. Past some trees the cutting gave way to an old bridge, which a party of young adventurers were using for abseiling. Apparently it is also used for bungee jumping.

Adjacent to the bridge, limestone steps, rich in crinoids, descended to the River Wye where brown and rainbow trout swam. Continuing along the riverbank Chris pointed out a possible exposure of lava with possible vesicles. Further on we came across an exposure of dark, vesicular basalt lava, LMDL, underlying MDB. The top surface of the lava appeared rubbly and broken up suggesting an erosion surface, upon which the overlying MDB was later deposited.

Location 2: Geology Information Board on railway track near Litton Mill



Buxton UMDL at Litton Mill

Heading back to the car park we took two cars to Location 2 and parked in a layby off Litton Mill Lane. Following the lane we stopped before some limestone houses for lunch before ascending a steep wooded track to another limestone cut section of the Monsal Trail. Following the Trail west we came to an interpretation board on the south side of the cutting.

Within the cutting wall was brown fine grained structureless, brecciated rock containing various shapes and sizes of lava clasts, identified as the UMDL, which sits above the SQB. Ambiguously the interpretation board suggests that the brecciation resulted from an explosive interaction of the lava flow forefront entering marine conditions. However, this does not explain ►

some of the features seen within the exposure. The brecciation more likely represents rubble from the hardened outer surface of the lava flow carried along and becoming incorporated into the flow as it cooled. Eastwards from the exposure the overlying Monsal Dale Beds become younger and dip in accordance with the UMDL topography before becoming shallower where limestone filled the depression before the lava front.

Walking eastwards back along the Trail we were shown dark, smooth chert clasts within the jointed limestone, which also contains occasional fossils. Eventually the sealed up entrance to the Monsal Dale tunnels blocked the Trail. Interbedded within the limestone high up on the southern cut face was a yellow green/red layer of either clay or weathered volcanic ash, possibly produced from the interaction of a hot lava flow coming into contact with water. Again, an adjacent interpretation board rather ambiguously indicated that this layer was a lava flow.

Location 3: Tideswell Dale Quarry

Tideswell Dale Quarry was another short drive, via The Miller's Dale Station along the B6049. Starting from a picnic site we followed a rough vehicle track through a small gate into a field of wild flowers, within Tideswell Dale Quarry. Exposed here was spheroidally weathered Tideswell Dale Dolerite (TDD), dated around 287 Ma, intruding the LMDL and CTL. The dolerite contains olivine and bronzite, a minor magnesium orthopyroxene mineral with a distinct cleavage and crystalline habit, which gives the dolerite a slight golden tinge. Intrusion into wet country rock has obscured the age of this dolerite. Beyond the quarry and coincident to its top, the LMDL could be traced as rounded masses on the limestone hillside. An east-west trending fault south of the quarry has downthrown the LMDL into Miller's Dale cutting of the dolerite to the south. TDD was probably extracted for roadstone in the past.

Location 4: Calton Hill Quarry

We drove to our final location, Calton Hill Quarry, via Miller's Dale, the A6 towards Buxton and the A5270. The quarry was reached via a gravel road, a field and an overgrown, tree covered path. This location was first discovered in 1894 and has attracted a lot of interest. Exposed here is a mixture of



vent agglomerate, basaltic lava, dolerite showing columnar jointing and hydrothermal mineralisation. It is believed that the quarry is a volcanic vent through which brecciated vent agglomerate initially erupted, followed by the basaltic lavas. This may be the origins of the UMDL and LMDL but needs confirming. Later, dolerite magma was intruded into cracks and pipes within the vent and finally minerals such as calcite, olivine and quartz (amethyst) were mineralised hydrothermally within any remaining spaces. As the dolerite rose up through the vent, reduced pressures allowed gases within the molten rock to escape and form vesicles once it solidified.

Around 17:00 we returned to the cars to head back home. I would like to thank Chris for another very interesting field visit and hope we will visit Derbyshire again. ■

Andy Harrison

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Geobabble

Sorting out the loft turns up some interesting things, and in my case files of old geological leaflets, notes and letters. One email I recently discovered related to my interest in the final destinations of superb Silurian fossils originating in Dudley, mostly from the Wren's Nest. It was from an old friend of mine who now lives in Perth, Western Australia, who had responded to my request for information by telling me that there was prominently displayed in Western Australia Geology Museum, a "Crinoid from Dudley, Worc" (sic) together with many other typical Wenlock Limestone fossils. He followed this up by attending a lecture given by Ken McNamara in the University of Western Australia which houses the museum. At that time (2004) he was the Curator of Invertebrate Palaeontology; he is now a Senior Lecturer at the Cambridge Department of Earth Sciences. He explained that the fossils were part of the James Tennant Collection and outlined the interesting history of the collection, after paying tribute to the Prof Hugh Torrens of Keele University for much of his source material.



James Tennant

James Tennant came to London in 1824 at the age of 16 looking for work and was apprenticed to James Mawe in his mineral, fossil and shell shop at 149 Strand. He became manager in 1829 on Mawe's death, working with his widow. In 1838, through his influential contacts of 'gentlemen collectors' he was appointed to teach mineralogy at King's College, London and then became Professor of Geology. He died in 1879 having accumulated a number of outstanding mineral and fossil collections, containing many fine Dudley specimens. One collection was acquired by the British Museum, but the Keeper of Geology, Henry Woodward, decided to send it to Western Australia, where two of his relatives, Henry Page Woodward, Government Geologist and Bernard Woodward, Curator of Geology in the newly established Western Australia museum, were in need of good material. Thus nepotism resulted in Western Australia getting an excellent collection.

Unfortunately, transporting it was another matter. Heavy rock and mineral specimens were loosely packed alongside fossils. The softer specimens suffered greatly by the constant rolling of the vessel, the delicate Eocene fossils were ground to dust. Further calamities occurred when unloading at Fremantle, a boat capsized and several crates were submerged for a significant period. When they were finally unpacked it was found that the sea water had either removed the labels or made them illegible. Apparently labels were still being matched to specimens in 2004. However, what was salvaged forms the nucleus of an excellent collection containing fossil types that are poorly represented in Western Australia. Among them are several fossils that first saw the light of day at Dudley. ■

Bill Groves

Members' Forum

An Unexpected Geological Gem

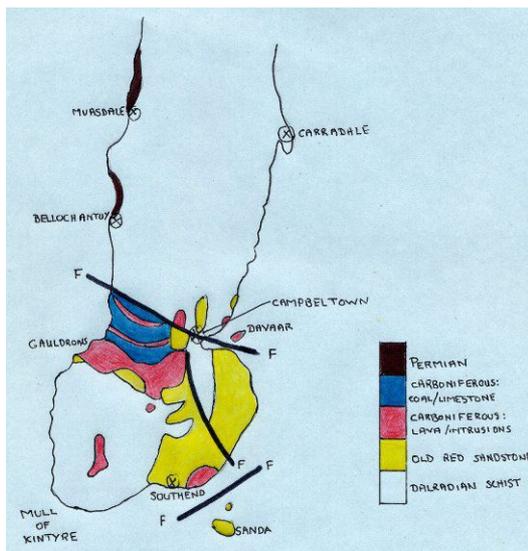
In June this year I was invited to go on holiday with my daughter and family to Kintyre - provided I did not bore them with geology! My son-in-law comes from Campbeltown and his parents and 4 brothers still live there. The house we were renting was near Skipness with a wonderful view over the northern tip of Arran and a quick glance at the geology map showed the locality to be predominantly Dalradian schist with some intruded dykes, so I concluded that I could keep to the agreement. An hour or so quietly exploring the beach near the house should locate a few dykes. However, I did remember from a previous visit that Campbeltown did have a history of coal mining.

There are only two roads down through Kintyre; the main road to Campbeltown goes down the west coast and a very winding single track road down the east coast. Driving down the former on the first evening I noticed what looked like occasional raised beaches of reddish sandstone at Bellochantuy and Muasdale (see black areas on the simplified geological map). These I subsequently learned were small outcrops of Permian sandstone lying unconformably on the Dalradian schists over twice their age and which are related to much larger deposits underwater all round Kintyre. This fact I learned ►

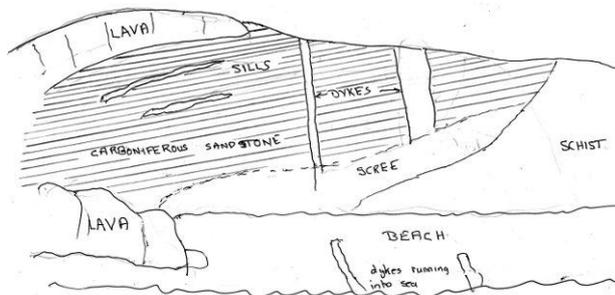
from a book my son-in-law had brought with him entitled "The Story of Campbeltown" in which the first chapter is entitled "Geology and Scenery of South Kintyre" by Julian Hill. I was now in my element and after reading it I asked if we could visit a place called 'The Gauldrons', situated on the west coast near Machrihanish, the site of the old colliery and described as one of the best sites in Kintyre for geological study. Surprisingly this was accepted because it had an excellent beach and in the event we all had a great time with my two grandsons scouring the beach and competing to find me the best rock specimens.



Walking down the beach to the south west, the face of The Gauldrons opens up as



shown in the sketch and photo (left). The sandstones (cornstone), the lava flows (Clyde Plateau Lava) and sills are Carboniferous, whilst the dykes are Tertiary originating from Arran. The lava flows and the dykes can be followed clearly through the cliff and out across the beach to the sea. A particularly large dyke can be seen from near the south west end of the beach (below). The coal formation is not exposed but it covered a large area as shown by the distribution of the sedimentary rocks (blue) in the map. The full geological map of the area (Campbeltown, Sheet 12) shows the complexity of the lava flows in detail (red in the simplified map above).



By contrast the south east corner of Kintyre (yellow) is Devonian (Old Red Sandstone Conglomerate) rejoicing in such names as the New Orleans and Bastard Formations. To quote from the book: "Such outcrops (of Devonian and Carboniferous) are virtually unknown in the Highlands beyond the Midland Valley. Yet there is no Highland Boundary Fault to separate Midland Valley from Highland rocks. This is a great geological puzzle and has been hotly disputed by geologists. From current theories it looks as if Southern Kintyre formed a crustal downwarp in these geological times allowing accumulation of Old Red and Carboniferous deposits on the edges of the Dalradian. Later faulting allowed a block of crust to subside, now represented by the Laggan (a large flat plain to the west of Campbeltown) and bounded by the Kilkennie and Drumlemble faults, today forming the scarp edges of a rift. The Machrihanish coals were thus preserved from erosion."



This area would make an excellent basis for a 3-4 day geological trip but there are very few roads in the area and a lot of leg work may be necessary.

So much for a geology free holiday! ■

Peter Twigg

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