Newsletter No. 216

December 2012

The Black Country Geological Society

Contents:

Copy date for the next Newsletter is

Wednesday 16th January 2013

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, telephone: 01384 370 188, mobile: 0797 333 0706 or email: fieldsecretary@bcgs.info

Monday 10th December: ***(Indoor meeting, 7.00 for 7.30 start)*** **BCGS Members' Evening and Christmas Social.** This is our annual chance for members to share their geological experiences in a sociable atmosphere with Christmas buffet provided by the Society. Please get in touch with Graham at the museum (meetingsecretary@bcgs.info tel 01384 815575) if you would like to do a short presentation, or show some of your specimens etc.

Monday 21st January ***(Indoor meeting):*** **'The Mineralogy of Scotland'. Speaker: Roy Starkey,** President of the Russell Society and founder of the British Micromount Society. Roy writes: Rocks dating back over 3 billion years are found in some parts of Scotland and these rocks (Lewisian gneiss) were at one time many kilometres deep in the Earth's crust. We can recognise five geologically distinct provinces in Scotland - Lewisian gneiss and Torridonian of the NW; Moine rocks of the Central and Northern Highlands west of the Great Glen Fault; Moine and Dalradian of the Central and Grampian Highlands; Midland Valley, and the Southern Uplands. These areas are separated by large faults: the Moine Thrust, the Great Glen Fault, the Highland Boundary Fault and the Southern Upland Fault. Glaciations have shaped the surface rocks, giving rise to varied scenery. The geological variety and differences in the ages of rocks mean that Scotland's mineralogy is diverse and interesting. This talk will highlight some of the key areas of interest and hopefully provide the impetus for members of the audience to go and explore for themselves.

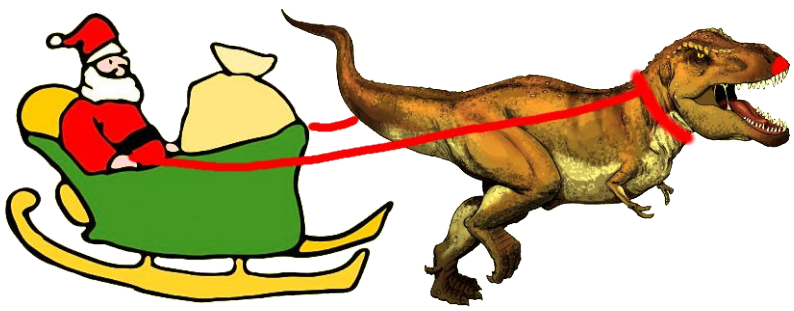
Saturday 2nd February ***(Conservation day):*** **Rowley Hills**. Meet at St Brades Close at 10:30 for an 11:00 start. Directions: from Birmingham - along the Birmingham New Road (A4123) turn left on to Tower Road (right if coming from Wolverhampton). Just after Bury Hill park, turn left onto St Brades Close. Wear old work clothes, waterproofs and stout footwear. Please bring gloves and garden tools; loppers, secateurs, forks and spades if you have them. Also bring lunch. Finish at 14:30.

Saturday 2nd March ***(Conservation day):*** **Return to Barr Beacon.** Meet at 10:30 for 11:00 at the entrance on B4154 Beacon Road, opposite Bridle Lane (the southern entrance to Barr Beacon) Grid ref: SP 060 967. Wear old work clothes, waterproofs and stout footwear. Please bring gloves and garden tools; loppers, secateurs, forks and spades if you have them. Also bring lunch. Finish at 14:30.

April ***(Field meeting):*** Warwick and Warwick Museum. Date and details tbc.

May ***(Field meeting):*** Oxford University Museum of Natural History. Dates and details tbc.

June ***(Field meeting):*** Trip by canal boat through the Black Country. Details tbc.



A Merry Christmas to all our readers!

100 Years of Geology at Dudley Museum and Art Gallery

Wednesday 12th December: 5.00 – 7.15 pm: Centenary of the Geological Displays at Dudley Museum. On 12th December 1912 Professor Lapworth of Birmingham University opened the new Geology Gallery at the Museum (the first in this building). This anniversary event celebrates 100 years of geology exhibitions, collections care, conferences and research contributions at Dudley Museum and Art Gallery.

After a short reception, there will be a welcome from the worshipful Mayor of Dudley, followed by some special events and a chance to see the re-vamped geological displays. The celebrations will finish with the launch of the Dudley Museum 'Year of Geology' 2013. So please join us if you can to raise a glass to the past and look forward to the future of geology in Dudley Museum and Art Gallery.

NB: Due to limited space this invitation is extended to BCGS members only.

See the poster for full details of the programme (enclosed for postal recipients, already sent to email recipients). Please reply as soon as possible, to help with practical arrangements.

RSVP to Graham Worton at: Dudley Museum & Art Gallery, St James Road, Dudley DY1 1HU; Tel: 01384 815575; email: graham.worton@dudley.gov.uk

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.

North Staffordshire Group of the Geologists' Association

Thursday 17th January: The forensic use of microfossils. Hayden Bailey (formerly Palaeoservices).

Thursday 7th February: How big is your bang? (Volcanoes). Dr Dougal Jerram (Dougal Earth).

All talks are held in William Smith Building Room 0.06, Keele University, at 7.30. Further information at: www.esci.keele.ac.uk/nsgga/

Herdman Society Symposium

Saturday 16th February 9.30 - 5.00: 'Geoscience Frontiers 4'

A day of lectures at the Sherrington Lecture Theatre, University of Liverpool, and wine reception from 5.00 - 6.00. Full details will be published in early January. The charge to non-students will, subject to sponsorship, probably be £10, which includes programme, buffet lunch, tea/coffee and wine reception.

Dr Roger Benson (Oxford) **Dinosaur evolution and Mesozoic faunas as a guide to biodiversity**
Dr Gareth Collins (Imperial) **Impact: Earth! The hazard and mitigation of asteroid impacts**
Prof Fergus Gibb (Sheffield) **Nuclear waste: geology has a better answer**
Prof Cor Langereis (Utrecht) **The past and future of the Mediterranean**
Dr Ed Llewellin (Durham) **Bubble, bang, burp! Big experiments in volcano physics**
Prof Paul Wignall (Leeds) **The end-Permian mass extinction and its aftermath**

Persons interested in attending should contact Helen Kokelaar, e-mail: herdman@liverpool.ac.uk

Manchester Geological Association

Saturday 12th January: The Broadhurst Lectures: The Palaeontology of China. Registration: 10.00 for 10.30, University of Manchester (see web site for full details).

Doushantuo Microfossils: the oldest animals in the fossil record?
Dr John Cunningham, University of Bristol.
The Cambrian Fossils of Chengjiang: the flowering of early animal life. Professor David Siveter, University of Leicester.
Shaking the tree of life by the roots: a bottom-up perspective on the Palaeozoic and Mesozoic fossil plants of China . Dr Jason Hilton, University of Birmingham.
Jurassic Spiders from China. Professor Paul Selden, University of Kansas.
Exceptional Preservation of Dinosaur Eggs and Embryos from the Upper Cretaceous of Henan Province, China. Dr John Nudds, University of Manchester.
Pterosaurs from China - Another great leap forward? Dr David Unwin, University of Leicester

£15.00 per head for the buffet lunch and morning and afternoon refreshments, booking essential. **Booking form is online.**

Further information about indoor meetings go to: http://www.mangeolassoc.org.uk/ or email lectures@mangeolassoc.org.uk Visitors are always welcome.

The Oxford Colloquium

Saturday 16th March: Day of Lectures. Six distinguished speakers will give illustrated lectures on topics drawn from across the Earth sciences**.** Colloquium goers not only experience a sumptuous smörgåsbord of geo-disciplines, they benefit from meeting like-minded individuals in and around the museum precincts. This event is organised by the Oxford Geology Group.

The speakers are: Prof. Simon Conway Morris, Prof. John Tellam, Prof. Peter Burgess, Dr Dave Waters, Prof. Martin Siegert and Dr. Richard Walker.

Further information: http://oxgg.org.uk/the-oxford-colloquium/ Tickets: £15.00. Purchase (in person) from the Oxford University Museum of Natural History shop, or by mail from Alison Saunders. Contact her at events@oxgg.org.uk.

Warwickshire Geological Conservation Group

Wednesday 16th January: Volcanoes around the world. Alan Clewlow (Volcanic Experiences Tours).

All meetings will be held in The Lammas Room, Hill Close Gardens, Warwick CV34 6HF and start at 7.00 for 7.30 – coffee beforehand! For more details visit: http://www.wgcg.co.uk/ or contact Ian Fenwick swift@ianfenwick.f2s.com or 01926-512531. There is a charge of £2.00 for non-members.

Shropshire Geological Society

Wednesday 9th January: The threat of methane hydrate deposits and CO_2 sequestration. Dr Chris Rochelle.

Generally held at Shire Hall, Shrewsbury, commencing at 7.15 for 7.30. A nominal charge is levied for attendance by non-members. Further info at: www.shropshiregeology.org.uk/

Stamford and District Geological Society

Wednesday 9th January: Swallow holes & Wild Bores. Mark Grout, Environment Agency. tbc.

Meetings are held at Tinwell village hall, at 7.30. Further info. at: www.stamfordgeolsoc.org.uk/

Lapworth Lectures

Monday 14th January: Professor David Mattey, University of London, Royal Holloway. Title tbc.

Monday 28th January: Permissive environments or biological innovation? Fresh insights into the Cambrian explosion. Dr Graham Shields, University College London.

Lectures at 5.00 in the Dome Lecture Theatre, Earth Sciences, University of Birmingham. For further info phone: 0121 414 7294 or visit: http://www.lapworth.bham.ac.uk/events/lectures.shtml

Editorial

I'm pleased to report that our monthly conservation sessions are proving to be a great success. Organised in conjunction with the Birmingham and Black Country Wildlife Trust, these meetings have enabled us to provide some much-needed maintenance to several important geological exposures which have been cleared in the past, but have since become overgrown. The days have been well-supported, and greatly enjoyed by those who have taken part. If you haven't already tried it, do come along to the next session on Saturday 2nd February.

At the Wolverhampton Local History Fair on Saturday 17th November, our new pull-up stand had its debut outing, along with the new publicity leaflets (see the report on p.8). Committee members Gordon, Mike, Linda and Chris did sterling work to fly the flag for our Society at this event, but would like to see some new volunteers at such events in the future. The leaflets will be available at our Members' Evening on 10th December. Please take some and do your bit to publicise our Society and attract new members!

I trust that you are all now fully aware of the arrangements for the Centenary celebration at the Museum and Art Gallery on 12th December. This is a very special occasion and we hope that as many of you as possible will be able to come along. Don't forget to reply to Graham Worton (details on p.3).

Arrangements for indoor meetings in February, March and April are in the pipeline, but unfortunately not yet confirmed. We apologise for this but will give you the details as soon as possible.

The Midlands branch of the Geological Society in conjunction with the BCGS are organising a photographic competition (with prizes!). There will be 4 categories: Geology at work, Geology in motion, Geology and the Midlands, and Abstract/Creative Geology. Full details to follow.

Once again we have no suitable items for the 'Members' Forum'. In that space we want you to share your queries, photos, short items of interest, and let us know what you feel about the Society. What do you enjoy most? What else would you like the Society to do? Your comments and suggestions will be greatly welcomed by the Committee. Please get in touch, but also please note that the **copy date for the next issue is 16th January** (brought forward for personal reasons).

It remains only for me to thank all our contributors for their excellent and much appreciated items. With so many priority items - Society news, field reports, and topical subjects, the final instalment of your Editor's 'Italian Adventure' has been relegated to the next issue. But it's good news that we have so many meaty items for our festive issue.

On behalf of the committee, I wish you all a very Happy Christmas and look forward to seeing you at some of our events in the New Year. ■

Julie Schroder

The Dudley Bug

Welcome to the Christmas 2012 edition of 'The Dudley Bug'. As we get closer to the big day anticipation builds until it's finally time to watch the greatest Christmas movie of all time... 'The Muppets Christmas Carol'. This got me thinking, if the Muppets can have a Christmas Carol, why not us geologists? Based on a completely untrue story, join me for that classic Dickensian Christmas tale… geology style... Enjoy!

Chris and Ali

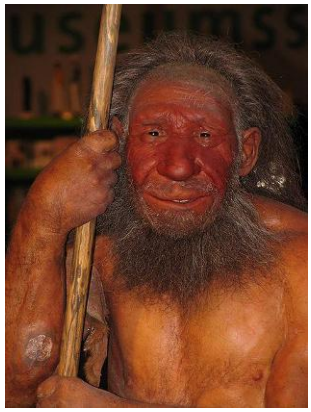
A Geologist's Christmas Carol

Back in the depths of the Little Ice Age, lived a cruel, cold-hearted man called Professor Ebenezer Lapworth. Ebenezer owned a geotechnical engineering firm called 'Scrooge's Slope Stabilisation' and employed a significant workforce. However, his employees worked for a pittance. They had no holidays for fossiling and defiantly NO coal in their stockings! The Black Country Geological Society once approached Ebenezer to assist with a graduate training scheme, but were immediately told on no uncertain terms to 'Rock Off!' and take their graduates with them.

It was approaching Christmas, a boom time for Ebenezer's business as vegetation was thin and access to rock faces was at its easiest. For this reason his employees worked tirelessly throughout the holiday, but Christmas 2012 was one which Head Geoscientist, Dr Bob Fossil was determined to spend with his family. It was Christmas Eve and after much encouragement from his colleagues, Dr Fossil built up the courage to ask for the Christmas week off, which Ebenezer dismissed in a fluster of mutterings and abuse. However, Dr Fossil held a trump card: who else would be open for business? Ebenezer had no reply, and finally relented. Ebenezer Lapworth offered the consolation prize of one day's unpaid holiday on Christmas Day, which allowed Bob Fossil to spend the last Christmas with his very ill son.

That evening on the eve of Christmas, the freezing air felt like a million ice daggers pounding Ebenezer's wicked face as he stumbled home from the local real ale pub. Reaching his dark, mysterious house he flung open the door to reveal a personal museum of rare, sparkling and very pretty rocks and fossils. That evening Ebenezer sat in a single room eating rock cakes, with only a small lava lamp and a glowing specimen of uraninite for illumination (to save money on lighting the whole house!). Suddenly, the lava lamp stopped convecting and the Geiger counter stopped crackling. Out of the gloom appeared a ghostly vision. "Who are you?" Ebenezer muttered under his breath. "I am your old business partner... Jacob Murchison" groaned the transparent figure. Murchison warned Ebenezer of his impending doom upon his death, constricted by the chains forged in life (and in the Black Country) for all eternity. Forgivingly, there was a chance to save his damned soul. Squirming for some sort of comfort, Ebenezer was primed for the visit of three ghosts during the night. In a flash, the room returned to normal, convection resumed and the mineral glowed once more.

Ebenezer blamed his hallucinations on the real ale, but went cautiously to bed carrying his uraninite with him. As he struggled to sleep he counted trilobites jumping over coral until his heavy eyes shut tight. The next thing he remembered was a bright light illuminating the room. A rough, primitive voice grunted "I am the ghost of Christmas past". Ebenezer peered from beneath the duvet to see a big nosed, hairy Neanderthal pointing a spear at him. With a jab of the flint spearhead they were transported to Ebenezer Lapworth's childhood. Ebenezer looked helplessly at his days as a young geology student, throwing rocks at the teacher and making smaller children lick the halite samples. He gazed on as he mixed up the sequence of metamorphic samples laid on the table, baffling the class. "No more!" he yelled like a little girl. The Neanderthal lead him away to his first Christmas party in a geotechnical company. During the vision he saw himself as a graduate, complaining to his manager about how much the party has cost and that the money would be better spent on drill heads. In a pulse of light the ghost strolled off into the distance and Ebenezer was back in his bedroom gasping for breath. ►



Minutes following the exit of the first ghost a second phantom ascended from the floor, which was tiled in Rapakivi granite. “I am the ghost of Christmas present” snorted a deep, muffled voice. To Ebenezer’s horror, towering over him was a giant talking Pleistocene ground sloth known as *Megatherium*. Ebenezer frowned as the sloth guided him into a white mist with his enormous claws, “Come, we have little time as I grow older every second” claimed the sloth. They reappeared amongst the excitement of Christmas day in the market, seeing the hustle and bustle of people buying Christmas dinner. They then viewed Christmas in a miner’s cottage, where they were short of coal and not a fossil display in sight, yet they were full of joy and happiness on this day. Finally, the sloth took Ebenezer to observe the scene at Bob Fossil’s house. There, he gazed on to see a happy, vibrant scene of Bob Fossil with his family and very ill son, Trilobite Tim. He continued to observe as Bob’s wife began complaining about Ebenezer, his greed and his cruelty to everyone who crosses his path. Ebenezer was shocked when Bob stuck up for him, explaining how he was responsible for providing their Christmas dinner as Bob’s employer, to the answer of “Huh… This measly meal… as he feasts in luxury!” from Bob’s wife. “Enough, spirit, I have seen enough” blubbered Ebenezer before reopening his eyes to see the sloth, now looking very old, walking away from him in a spooky old graveyard.

Moments later, a dark spectre materialised in the fog, “I am the ghost of Christmas’s yet to be” whispered a quiet, yet deep voice. Shuddering vigorously, Ebenezer stepped closer to see the Woolly Mammoth eyeing him up. The mammoth pointed with his trunk to a gravestone made from blue Larvikite granite. Ebenezer stumbled over like a drunken fool and reluctantly wiped away the grime to reveal his own name. Falling backwards in horror, he grasped for comforting words, “The future can be changed… a man can break his chains” wept Ebenezer. In a heart stopping second, they emerged into a grotty backstreet, looking on at a grubby street trader. “Get your rocks here… fossils for a fiver” the trader yelled. “Who did this collection belong to?” whispered Ebenezer. The mammoth stood and pointed his trunk. A group of women were discussing the collection, “I’m sorry the owner's dead… sorry he didn’t die sooner”. A second woman replied, “That Ebenezer Lapworth was an evil geologist, who didn’t document his collection properly and now it’s worthless”. Now a whimpering wreck, Ebenezer had one final call… back to Bob Fossil’s house. Inside, the mood was solemn, near the fire sat an empty chair with a rock hammer and hard hat laid on the seat. Ebenezer immediately realized that it was Trilobite Tim’s chair. “A man can change his future!” Ebenezer screamed with fear, and with that the phantom mammoth faded away.

Upon opening his eyes Ebenezer Lapworth was in his own warm bed. Like a whippet he flung himself free of the sheets and hung out of the window. A child carrying a lump of schist hurried past until Ebenezer shouted “Good Sir, what day is it?” A high pitched nervous reply came, “Why… it’s C… C… C… Christmas Day”. A giant grin grew on his face; the spirits came all in one night and he had not missed the big day. Ebenezer called the boy again to ask, “You know the large *Titanites* ammonite in the shop window? Go and buy it for me boy”. The boy was swamped by the *Titanites,* as he followed Ebenezer towards Bob Fossil’s house. On the way Ebenezer donated his prized fossils to the poor, and invited graduates to train in his company. When they finally reached Bob’s house he was greeted with anger from Bob’s wife, until she saw the size of the ammonite being delivered for them. She stood motionless with shock as Ebenezer offered a very large pay rise for Dr Bob Fossil and his fellow geoscientists. From that day forward Ebenezer became like an uncle to Trilobite Tim (who did not die) and was much loved as a generous member of the Black Country Geological Society. ■

1st image - Stefanie Krull, Neanderthal Museum
2nd image - Wikimedia commons
3rd image - Dantheman9758, Wikimedia commons
4th image - Wolverhampton Arts and Museums

Wolverhampton Local History Fair

The Wolverhampton City Archives and Local Studies group organised their third Local History Fair on Saturday 17th November, in the restored Molyneux Hotel which now houses the city archives, right next to the 'Wolves' football stadium.

The BCGS was invited to attend and we decided that this was an ideal occasion to promote our Society and inform visitors about the importance of geology in the development of the Black Country and concomitant birthplace of the Industrial Revolution.

We exhibited an eye-catching range of fossils, fossil casts and minerals from Dudley Museum & Art Gallery, by kind permission of Graham Worton. We had our newly printed BCGS publicity leaflets and, at long last, a splendid 'pull-up', specifically designed to advertise our society. We displayed it as prominently as we were able in the Rococo Room, along with some seven or eight other society displays ranging from the Dudley Canal Trust, Lock Makers, Crochet and Lace Makers, World War One Re-Enacters, Wightwick Manor, to Claverley Village.

The Molyneux housed a total of 26 societies along with a Craft Workshop, and the enigmatic 'Dr. Fossil', who turned out to be a lot younger than we had thought! Indeed Dr Fossil was none other than our own Chris Broughton masquerading as a brontosaurus! (He was very convincing!)

Visitor numbers totalled 362, including many children who had been targeted for the first time this year. This was reflected in the large number of young people who visited our stall and displayed great interest in geology. One young man who visited the BCGS stall, manned by Mike Williams our Treasurer, Linda Tonkin, our Secretary, and yours truly, told us that he had a piece of a meteorite which he had bought through the Internet. Thoughts of provenance sprang to mind - especially as I had been misled into buying the most fantastic lizard fossil a few years ago in China - they were being manufactured by the thousand!

This was a successful, tiring but worthwhile occasion which, short of the eruption of a super volcano in the Black Country, nuclear war, bubonic plague, or simply being, 'took in the night', we shall repeat next year, hopefully attracting a few more of our members. ■

Gordon Hensman

Field Meeting Reports

Sunday 5th August: Caer Caradoc and Comley Quarry, Shropshire. Led by Keith Hodgkiss (Shropshire Geological Society - SGS)

This field visit involved a 5 mile circular walk of Caer Caradoc Hill, and included a visit to Comley Quarry. Starting and finishing at Botvyle Farm, our route lead us east, uphill, to a stile, then southwards around the southern end of Caer Caradoc Hill. We continued northwards to the hill's summit, then downhill to Comley Quarry, before heading south again and back to the cars. Between the farm and hill summit our height changed from 220m to 459m.

Heading southwards, we followed the line of the Church Stretton Fault, which extends for up to 150 miles, NNE to SSW. It separates Silurian rocks to the west from Precambrian - Cambrian rocks to the east. The Church Stretton Fault is one of several making up the Church Stretton Fault Zone, which was discovered and described by Edgar Sterling Cobbold. He labelled each fault as F1, F2, F3 and so on, F1 being the Church Stretton Fault.

The western slopes of Caer Caradoc Hill are thickly vegetated and outcrops pretty rare. Consequently the best way of seeing the rock types present is from the gravels in the path. Rhyolites generally dominate the south parts of the hill along with, to a lesser extent, andesite and dolerite. Vesicular basalts dominate the northern half of the hill. The rocks of Caer Caradoc belong to the Precambrian ►

Caer Caradoc

Uriconian Volcanics, dated to between approximately 560 Ma and 542 Ma. We last encountered these rocks in July during our field visit to Haughmond Hill and the Ercall Quarries.

To the west of the hill lies the Church Stretton Valley, comprising Silurian rocks of Ludlow Shale, Wenlock and Aymestry Limestones. The Church Stretton Fault has downthrown these by approximately 1000m. Keith told us that before 350 Ma, strike-slip movements occurred along the Church Stretton fault, which became vertical after 350 Ma. The Church Stretton Valley was produced approximately 20 Ma when movements along the Church Stretton Fault became listric, with the Long Mynd acting like a hinge.

Looking across the Church Stretton Valley, the Long Mynd comprises the Longmyndian Supergroup, which includes the Wentnor and Stretton Groups. Keith pointed out the sequence of Stretton Shale, Burway, and Synalds Formations on the Long Mynd hillside.

The eastern side of Caer Caradoc Hill is delineated by fault F2, which shifted Cambrian Wrekin Quartzite up against the Precambrian Uriconian rocks. Low ground in the eastern foreground consists of Ordovician Harnage Shales, beyond which is the Sharpstone Ridge scarp comprising Precambrian dolerite, conglomerate and rhyolite, and the Hope Bowdler hill, which includes Wrekin Quartzite (Cambrian). On the eastern horizon we could see towards the Black Country and Brown Clee Hill (Devonian and Carboniferous).

Comley Quarry is to the north end of Caer Caradoc, and contains the St David's and Comley Series. These units are made up of sequences of sandstone, limestone and conglomerate, and also contain fossil brachiopods and trilobites, such as *Olenellus*, *Eodiscus*, *Protolenus* and *Strenuella*. The Shropshire Wildlife Trust now manages the quarry, which is very overgrown and the rock exposures hard to see. Further north is the Lawley Hill and on the northern horizon we could see the Wrekin, both of which also consist of Uriconian Volcanic Rocks. Between the Lawley and Caer Caradoc are the Wrekin Quartzite (Cambrian) and the Shineton Shale (Ordovician).

South of Caer Caradoc is Helmeth Hill, comprising Helmeth Grit (Precambrian), which also outcrops on the southern end of Caer Caradoc.

The Uriconian Volcanics are believed to represent aerial fall and flow deposits that accumulated on the flanks of Precambrian/Cambrian volcanoes. These volcanoes formed an island arc above a subduction zone situated to the north of the southern supercontinent of Gondwanaland. The Longmyndian Supergroup is believed to have been deposited within a subsiding basin, adjacent to the island arc.

During the last Ice Age the Church Stretton Valley would have been filled with ice, with the hill tops poking above. The retreating ice has left behind several features including melt water valleys, drumlins and glacial till.

I would like to thank Keith for a very enjoyable and informative day out and hope that we can do more such trips in the future. ►

The Lawley and the Wrekin from Caer Caradoc

Saturday 18th August 2012: Wren's Nest and Dudley Museum and Art Gallery. Led by Graham Worton (BCGS, and Curator of the Dudley Museum and Art Gallery.)

This fieldtrip, attended by members of the BCGS, the Shropshire Geological Society and the Teme Valley Geological Society, was not just a typical tour of the geology at the Wren's Nest, but was more about exploring its importance, both locally and internationally. At first glance the Wren's Nest looks like an ordinary wooded and vegetated hill, poking up above the Black Country landscape, sandwiched between the 'Priory' and 'Wren's Nest' housing estates to the east and west. Other than locals and geologists, few outside the Black Country have ever heard of Wren's Nest. So what makes this site so important? According to Graham, the site provides an excellent insight into the interactions between rocks and the local dense population.

History

During Prehistoric to Roman times, the Wren's Nest formed part of a major communications route between northern and southern England. Around 1000 years ago, limestone was first extracted here probably to acquire good quality building stone such as that seen in the keep of Dudley Castle, built in 1300AD. It was also burnt to produce lime for agricultural purposes, which created 'lime pies'. Lime was used locally to improve the pH and 'sweeten', or break-up, the soils surrounding Dudley derived from Carboniferous Coal Measures, which were acidic and clayey.

In the 1600s demands on wood for timber forced people to look for alternative fuel sources to that of charcoal. In 1619 Dud Dudley, son of the Earl of Dudley, was using coal as fuel and limestone as flux during iron smelting to produce a good quality product. At this time the Dudley estate owned over 10,000 ironworks in a 5 mile radius of Dudley Castle.

In 1643, Abraham Darby 1st, considered the Father of the Industrial Revolution, was born at Wren's Nest Lodge which was owned by the Darby family. Located off Wren's Nest Road, today only a sycamore tree stands where this former hunting lodge once stood. According to Graham plans are in place for an archaeological dig of this site in 2013, and the creation of a lasting memorial to the Darby family.

Limestone quarrying activities at Wren's Nest reached their industrial peak between 1750 and 1924. The earliest underground workings are believed to date from around 1796, and in 1805 a private underground canal was built to link Wren's Nest Hill's eastern flank with the Dudley Canal at Tipton Green. An etching of the Wren's Nest dated 1812 and kept at the Dudley Museum and Art Gallery, shows the hill totally devoid of trees.

Whilst visiting the Dudley area in the 1830's, Sir Roderick Murchison discovered the strong link between the rocks and fossils of Wren's Nest and the local community. Murchison encouraged the local miners to put together the Dudley collection of fossils, which is now housed in the Dudley Museum and Art Gallery. In 1839 Murchison published his defining work, 'The Silurian System', based on the rocks and fossils of Wren's Nest. Of the Wenlock fossils illustrated in this work 65% were from Dudley.

During the First World War the flat summit of Wren's Nest Hill behind Mons Hill College was used as a rifle range. Today it is used as playing fields. In 1956 the Wren's Nest was designated as the world's first National Geological Nature Reserve (NGNR).

Wren's Nest, the 'Snake Pit' quarry

In 2006 a 50th anniversary plaque, made by local school children, was placed adjacent to the 'Snake Pit' quarry and the former site of Wren's Nest Lodge. In 2007 Wren's Nest lost out to the Sustrans 'Connect2' project on the bid for the National Lottery's 'People's £50 Million Lottery Giveaway'. In 2008 local kids were involved in performing a geologically themed show in the Singing Cavern, beneath Castle Hill, as part of the Wrosne Project. The most recent trail, 'Ripples through Time' was opened in September 2011. This aimed to ►

improve access around the Wren's Nest NGNR and educate those following it. Numerous plaques and new interpretation boards have been put up as part of the trail, including one near the entrance to the Seven Sisters' caverns, which commemorates the local miners and geology.

Geography and Geology

Wren's Nest Hill rises to approximately 185m above the surrounding landscape and together with Castle Hill to the southeast and Hurst Hill to the north, forms a roughly NS trending ridge that represents the watershed for Central England. From here rainfall drains either eastwards into the River Trent or west into the River Severn.

These hills are isolated inliers of Silurian (Wenlock and Ludlow Series) rocks, comprising Lower Elton Member (youngest), Upper Quarried Limestone Member, Nodular Member, Lower Quarried Limestone Member and the Coalbrookdale Formation (oldest). Carboniferous Coal Measures make up the surrounding, flat low lying landscape.

The Wren's Nest provides a great natural laboratory and valuable teaching facility. The rocks illustrate basic geological principles like structure and stratigraphy, environmental geology and palaeontology. They are believed to have formed approximately 427 million years ago when England was somewhere between 20° and 30° south of the equator. They indicate evidence of a shallow tropical marine environment, probably a lagoon, resting on the edge of a continental shelf. Fossil ripple marks and other sedimentary features indicate high and low energy conditions, suggesting periodic storms and wave activity interspersed with quieter periods.

This environment was home to an abundance of marine life including corals, arthropods, crinoids and various molluscs that lived on or in the sea bed. Over 700 faunal types of macro, micro and trace fossils have been identified at Wren's Nest, of which 186 species were first discovered and described here and 86 are found nowhere else. The fossils come in a variety of morphologies indicating relatively shallow and deeper marine conditions. Discrete green beds of bentonite clay show that periodically falling ash temporarily smothered life in the lagoon, creating death assemblages. Over 30 such beds have been identified at Wren's Nest.

The rocks of Wren's Nest are comparable with those at Wenlock Edge, Shropshire and other locations along the English-Welsh border. All support the idea of a shallow tropical lagoon, but are different. Only 250 faunal fossil types have been identified at Wenlock Edge. It has been interpreted as the seaward edge of the lagoon, with more massive reef systems than those seen at Wrens' Nest, but the Wren's Nest contains the most complete section of Wenlock Series rocks.

The geology of Wren's Nest still throws up many questions. For instance, it tells a story of changing sea levels, but was this a local tectonic change or a more global event, i.e. from melting ice? Where was the volcano situated that produced the ash falls that killed life in the lagoon? Geologists often apply the Principle of Uniformitarianism, i.e. that the present is the key to the past, when interpreting rock sequences. However, can this idea be solely relied on when looking at the distant past?

New Teaching

Recent studies of the rocks of Wren's Nest have been shedding new light on the region during the Silurian Period. The bentonite beds have provided information on the direction and volcanic source that produced them (ie somewhere beneath Cheltenham), as well as wind direction and the chemistry of the magma chamber. The boundary of the Wenlock/Ludlow Series has been shifted approximately 2 to 3 million years due to radiometric dating of zircon crystals within the bentonite beds. Studies of corals indicate that during the Silurian Period seasons were longer, with a year lasting ►

New sculpture near the Seven Sisters' cavern

400 days. Lasers fired at mirrors left on the Moon by Apollo astronauts have shown that the Earth and Moon gap is increasing at an approximate rate of 4cm/yr. This suggests that during Silurian times the Moon was closer and brighter.

So, can the Principle of Uniformitarianism be solely relied on? Certainly similarities do exist between environmental conditions seen today and those of the Silurian Period. However, there would have been important differences. Would the Moon being closer produce bigger tides? Also, at that time the land would have been devoid of colonising plants. What would this mean to rates of erosion, weathering and sedimentation?

Caverns and Ecology

Limestone quarrying has left a legacy of trenches, quarries, caverns and open areas that many, especially locals, have enjoyed for decades. There are still big plans proposed for the Severn Sisters' and other caverns beneath the reserve since losing out on the Peoples' £50 Million. But for now the Severn Sisters remain stabilised and out of bounds.

Today the Wren's Nest is also important ecologically. Numerous animal and plant species take advantage of the array of habitats, including meadows and woodland, left behind from the site's industrial past. Locally rare plants such as Small Scabious, Milkwort, Quaking Grass, Hoary Plantain and Bee Orchids thrive in meadow areas. Ash, Beech and Sycamore make up the new woodlands, grown up since the 1812 etching was produced. Numerous bird and mammal species also use the reserve. These include 7 of the UK's 16 bat species, which had to be rehoused in the North Gallery when the Seven Sisters' caverns were infilled.

Local Community

Since the early days of mining, the reserve has remained at the hearts of the local communities, whether it is for work, recreation, education or just some solace. For years the site has been troubled with vandalism and poor behaviour; however the wardens have worked hard to make improvements and learnt valuable lessons in the process. Probably the most important has been to get the locals involved in the upkeep of the reserve, to educate them and make them appreciate what is on their doorstep. The wooden Dudley Bug seat and the 50th anniversary plaque are testament to this.

New proposals to develop the Mons Hill Campus into a housing estate have upset many groups. Not only is there concern for the impact of such a development adjacent to such a sensitive and important site, but also, what will this mean to the careful balance that exists between the Priory and Wren's Nest estate communities?

Dudley Museum and Art Gallery

We finished the day with a visit to the Dudley Museum and Art Gallery and the 'Climate Through Time' gallery. This gallery houses the Dudley collection of Silurian and Carboniferous fossils along with some Permo-Triassic specimens and 'Fluffy' the woolly mammoth. Graham spoke of his plans to create a timeline in the gallery illustrating Dudley's geology and highlighting names and places associated with it. He hopes that this will also get support from BCGS members.

Dudley Museum and Art Gallery

I would like to thank Graham for this very interesting and informative day and members of the Shropshire and Teme Valley Geological Societies for their attendance. I hope they enjoyed the day too and that we may see them again on future field trips. ■

Andy Harrison

Long Excursion to the Birmingham District - 1898

Jonathan Larwood was our guest speaker at our October meeting. He is the archivist for the Geologists' Association and he gave us a look at some of the old photographs of its history, particularly their fieldwork activities. He ended his presentation by describing a field visit to the Wren's Nest in 1898 where the party went by barge through the now closed tunnel that ends under the Seven Sisters cavern. I wanted to find out more, so I consulted the Proceedings of the Geologists' Association for 1898 (PGA Vol 15 pp: 417- 428), and found that the Wren's Nest visit was on the last day of what they called in those days a 'Long Excursion'. The whole excursion lasted a week and the Directors were Charles Lapworth, Jerome Harrison, W. W. Watts, Wickham King and Stacey Wilson.

The Dudley visit was on Wednesday 3rd August 1898 and firstly they walked up Castle Hill 'by Mr Claughton's kindness'. They viewed the geology from the summit and then took a limestone barge to the Wren's Nest where the caverns were illuminated with hundreds of candles. Here, Professor Lapworth explained the geology as it was related to the industries of the surrounding districts. They then walked to the Priory 'in answer to Mr Claughton's kind invitation' where they were 'most hospitably entertained'; they then went to the railway station for their journey home.

While reading the account of this excursion it is easy to see the great differences from our modern field trips. Their itinerary was built around the railway system, and they did far more walking than we would sometimes incorporate. Occasionally it is mentioned that carriages were taken when visiting a more remote area and it is interesting to speculate what sort of carriages would be required for a party of about 30 people. It was also evident both from Jonathan's photographs and the description in the PGA that this was basically a party of 'gentlemen'. They used their contacts with the local gentry to facilitate their visit, hence the hospitality given by Mr Claughton, a well-known figure in Dudley at that time. There were one or two ladies in the photographs but they seemed to be either wives or attached to a gentleman. Late Victorian society was very structured, and this field party would mirror this, perhaps like Downton Abbey, in the field.

Some erratics in West Park

On Monday 1st August they travelled to Wolverhampton, and the leader for the day, Jerome Harrison, took them to West Park to look at the boulders that the Corporation had preserved. They then drove - carriages presumably - to Tettenhall to have breakfast with Mr C. T. Mander, and look at more boulders collected by his father. This was an 'erratics' morning driving on to Trescott, Trysull and Seisdon, however the term 'erratic' is never used. It is always 'boulders', and this area is strewn with them. They listed some of those they identified: granites from Eskdale, Skiddaw and Galloway region; granophyre from Buttermere; felsite from St. John's Vale (?); felspathic (sic) dykes from S. Scotland and Lakeland; tuffs and andesites from Lakeland and Arenig; and a striking augite andesite from Falcon Crag in Borrowdale. This long day continued with visits to Enville, a climb to the top of Kinver Edge, ending with a drive to Stourbridge Junction to catch the train.

The party stayed at the Grand Hotel, presumably in Birmingham, and they visited various localities; Lickey, Kidderminster, etc., all reached by train. If I had a time machine I would have to go back and listen to Lapworth and Harrison in the field, and what they said to each other as they walked from one locality to the next. Both brilliant geologists ahead of their time. ■

Bill Groves

Please send material for the next Newsletter to:

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42 Billesley Lane, Moseley, Birmingham, B13 9QS.

Erratics - History of the Term

When I wrote the follow up to Jonathan Larwood's lecture, looking at the 1898 visit to our area, I remarked how the erratics they saw were always called 'boulders', and I wondered when the word 'erratic' was first used. I mentioned this to some of my geology friends from my university days and received some very interesting observations.

Darwin's erratics at Cwm Idwal

Louis Agassiz and Buckland both realised that ice played a part in moving boulders. Charles Darwin, along with Adam Sedgwick, visited Cwm Idwal in Snowdonia in 1832, and in 1842 Darwin returned to look for evidence of glaciation. The photograph shows the boulders that particularly interested him and other scientists of the time, including Alfred Russel Wallace. Darwin wrote a paper in 1842 with the term 'erratic boulders' in the title, and he wrote another paper in 1848 entitled: 'On the transportal of erratic boulders from a lower to a higher level'. (Darwin, C.R. 1848. *Quarterly Journal of the Geological Society of London* 4: pp 315-323.) My thanks to Brian Rosen for this information and the image.

Here the word 'erratic' is used as the adjective that it is, so is always coupled with a noun, in this case 'boulder'. It looks as if this is still the case in 1898, but it was later used as a noun, so you could talk about 'an erratic'. But this is just how language develops, and if you think hard I am sure you can come up with other terms; for example you travel on the 'underground', derived from 'underground railway'.

There is a very good site devoted to Darwin http://darwin-online.org.uk/ which is worth looking at. And on a less pedantic note, apparently there are pictures of excellent glacial valleys in the latest 007 film, Skyfall! ■

Bill Groves

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

The Piltdown Affair - 100 years later

It is now almost 100 years to the day since the anthropological find of the 20th century was first formally announced to the world, in the meeting room of the Geological Society in Piccadilly on the 18th December 1912. In fact the news had been broken in a scoop for the Manchester Guardian almost a month earlier (21st November) - a leak by a person unknown, in anticipation of much that remains unknown to this day.

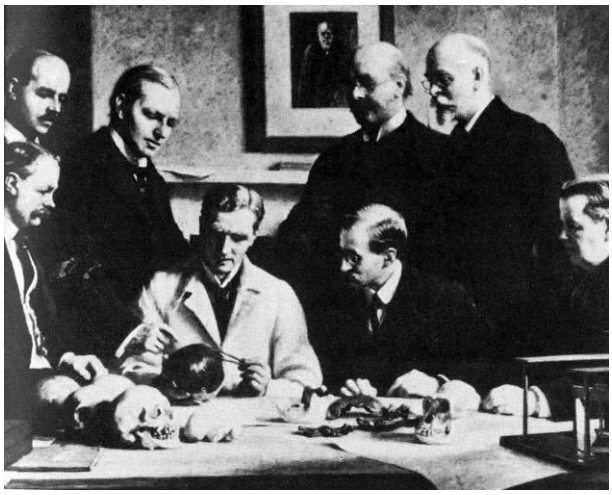
At that time the world was very different. Many discoveries in relation to the ancestry of our own kind had been forthcoming in the wake of Darwin's famous theory, but these discoveries were coming from foreign places, notably Germany, France, and Java, much to the irritation of a certain breed of home-grown anthropologist.

Charles Dawson was such a man, albeit an amateur. He had already amassed quite a CV in varied fields of geology, archaeology and local history which at the time had been met mostly with enthusiasm, and the respect of the scientific establishment. However, he had also trodden on a few toes, such that his reputation amongst his immediate fraternity (in Sussex) was rather more mixed. Indeed, it appears that he had also made a few enemies, including erstwhile friends and collaborators. ►

It was against this background that Dawson discovered the site that will now forever be inextricably linked to his name; an unassuming patch of gravel in the grounds of Barkham Manor near Piltdown which was being dug for stone used to repair the estate roads. Dawson believed it to be of more than usual antiquity for such deposits in the area. He asked the workmen to keep a watchful eye for any unusual remains they might uncover. In due course a few fragments of human skull showed up over a period of perhaps 4 years (1908-12), until Dawson felt the time right to involve the professional assistance of Arthur Smith Woodward of the Natural History Museum, with whom he had previous dealings with some of his other finds. This delay in presenting material turns out to have been a curious and recurrent practice throughout Dawson's scientific career.

This collaboration soon yielded a few more fragments of bone, both 'human' and other during the summer of 1912, with the assistance of a variety of friends, notably Pierre Teilhard de Chardin. He was a young Jesuit priest who would go on to have a long career in anthropology (with involvement in the story of 'Peking Man').

At the official unveiling, Woodward's interpretation of the initial material was far-reaching. Here was the long awaited 'missing link' between ape and humankind, the 'Earliest Englishman' (the title he would use for his autobiographical account in later years). His view was that the Piltdown remains constituted the first step towards humanity and warranted the designation of a new genus which he called Eoanthropus (the 'Dawn Man'). Missing links, incidentally, had been another oft-recurring feature amongst Dawson's earlier discoveries.



The portrait painted by John Cooke in 1915. Back row: (left to right) F. O. Barlow, G. Elliot Smith, Charles Dawson, Arthur Smith Woodward. Front row: A. S. Underwood, Arthur Keith, W. P. Pycraft, and Sir Ray Lankester. (Wikimedia)

The fallout from this declaration was only the beginning of a long tale of woe that lasted for over 40 years. Woodward's reconstruction of the cranium caused much controversy from the start, as did the association with a somewhat simian jawbone found alongside the more human-like skull bones. Much debate centred on the size of this individual's brain and the character of the dentition. A rather perplexing aspect of the material was that all the critical bits that would most satisfactorily reveal its true nature were broken off; in particular the canine teeth and the jaw articulation points.

Almost miraculously the canine tooth duly showed up (found by de Chardin) to settle that argument. The canine was just as Woodward had predicted, and exactly unlike that anticipated by the foremost authority of the day, Arthur Keith, an anatomist at the Royal College of Surgeons. Equally remarkable was how a second 'Piltdown Man' (actually a woman... but never mind such detail!) was duly discovered by Dawson at another site that to this day is not accurately recorded. This uncertainty was a bugbear to Woodward. He never managed to extract the exact details from Dawson, who was by late 1915 in terminal decline before his untimely death at the age of only 52 the following year. 'Piltdown 2' was formally presented by Woodward in 1917 to try and silence the 'dualists' notably abroad, (including, curiously, de Chardin!) who continued to question the compatibility of skull and jaw. Surely an accidental association of such material couldn't happen twice!

One particular find that has aroused much comment ever since it was unearthed, is an implement that is usually referred to as 'the cricket bat', on account of its appearance. Nobody could sensibly interpret this item; there was nothing like it in the archaeological record. It only came into a light of its own after the Piltdown material had been exposed as entirery fraudulent in the early 1950's. Evidence was slow to be assembled, as new analytical techniques emerged. Meanwhile the place of Piltdown Man in the evolutionary record was becoming more and more untenable with new discoveries in which changes in the jaw followed that of the cranium (the opposite of Piltdown): indeed Piltdown had been all but dismissed by the time the necessary evidence came along to consign him to oblivion. In the end it ►

was a fluorine test for dating bone, followed by radiocarbon dating that proved beyond doubt that Piltdown bones were **much** younger than imagined. Further examination also showed up the rather crude artificial staining and filing down of teeth to make Piltdown into something it never was.

In this light the 'cricket bat' *(actually an elephant thighbone, found near the skull pieces. Ed)* has been seen as a confession by either the forger himself or someone who had rumbled the whole business trying to expose the deceit. Unfortunately Piltdown's supporters could by that time see nothing wrong with 'their baby' and were taken in by the most preposterous piece of paraphernalia ever presented, which should have stretched credulity beyond breaking point.

The sad fact by this time was that nearly all the 'players' in the affair were dead and unable to defend themselves. Interpretations with the benefit of hindsight still vary. Was it a joke that went too far? Was it a case of somebody setting up someone else with malicious intent? Or was it a fraud, deliberate, premeditated and with intent to deceive and shape the path of evolutionary science?

Over twenty suspects have been named amongst the wealth of literature on the subject, including Chipper the goose who lived at Barkham Manor and was adopted on site as a 'guard dog'. If one applies the principle of Occam's Razor to the matter, that the simplest explanation is likely to be the right one, then (as my earlier tone might have suggested) I fear that Dawson's guilt is the only conclusion one can reach, though he could, just, have been duped by the real 'Moriarty' of crime.

The truth is that we shall probably never know for sure. I'm sorry to disappoint you in not coming up with a definite villain! Many books and learned articles in respectable journals have been written, each convinced of their own right. But no case adequately stands up to the full rigours of proof as required in a criminal court. Pretty much all evidence is circumstantial, albeit there is a lot of it to sift through. There have even been confessions of guilt, but they do not stand up to scrutiny (and beg the question: why a confession from someone clearly innocent?). So, although the known facts don't tell us 'who dunnit', they do perhaps give us a glimpse into that dark and mysterious aspect of human nature, the drive at any cost to get noticed or to create one's own legacy. ■

Mike Allen

Geobabble

In October my wife and I went to a meeting of the Birmingham Book Festival at the Custard Factory. We went to listen to a poetry reading by the young Black Country poet, Liz Berry. I did not expect an idea for Geobabble to arise, but that is what happened. Liz Berry was born and went to school in the Black Country and now lives in London where she works as an infant school teacher. She has an MA in Creative Writing from Royal Holloway and received an Eric Gregory Award in 2009. Her poems have appeared in many of the major UK magazines and on BBC Radio 3. Her debut pamphlet '*The Patron Saint of School Girls'* was published by *tall-lighthouse* in 2010. Liz has written about dialect poetry for The Poetry School and The Young Poets Network. The poem with geological connections is called 'Stone', and the Black Country influence is quickly recognised.

Stone

When you bought me a milk pan for Christmas
a woman at work said you were *as romantic*
as a stone. Watching you that evening,
I wondered what stone she had meant:
a chip of carpark gravel or something fancier
like the peridot in my mother's engagement ring?

My interest in you became geological.
Pulling on your wellingtons to walk the dog in the rain,
you were granite, durable, funereal almost.
Under the water of the bath, you were the agate
I found on Brighton beach as a child, sleek
and mottled as the skin of a seal. ►

At other times you seemed a rarer gem,
not emerald or topaz, nothing any other woman
would wear at her throat; but plainer, more lovely,
like the limestone walling the caverns back home
that purified the iron in blast furnaces
where keepers dripped jet from their beading brows.

And a man like that would never choose a rose
or a diamond ring, he'd stand for hours in a shop
on the coldest day, testing the unfamiliar weight
of a pan in his hand, assessing its metal,
imagining how the milk would taste on my tongue
as it poured, steaming, from that perfect lip.

Liz Berry has a website, if you would like to read more of her poetry, some of which is written in a Black Country dialect. www.lizberrypoetry.co.uk ■

Bill Groves

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