Newsletter No. 247
February 2018

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To find out more about this photo - read on!

Copy date for the next Newsletter is Sunday 1 April

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For enquiries about field and geoconservation meetings please contact the Field Secretary. To submit items for the Newsletter please contact the Newsletter Editor. **For all other business and enquiries please contact the Honorary Secretary.** For further information see our website: bcgs.info and Twitter account: @BCGeoSoc		

Future Programme

Indoor meetings will be held in the Abbey Room at the Dudley Archives, Tipton Road, Dudley, DY1 4SQ, 7.30 for 8.00 o'clock start unless stated otherwise.

Visitors are welcome to attend BCGS events but there will be a charge of £1.00.

Please let Andy Harrison know in advance if you intend to go to any of the field or geoconservation meetings. If transport is a problem for you or if you intend to drive and are willing to offer lifts, please contact Andy with at least 48 hours notice.

Saturday 10 February *(Geoconservation day):* Wren's Nest. Directed by the Reserve wardens. Meet at 10.30 at the Warden's house near the former Mons Hill College site, approached along the access road leading into the new development adjacent to the Caves Pub on Wrens Hill Road. The day will involve scrub clearance and a Geo-blitz to record findings. Bring gloves, stout footwear and packed lunch. Wardens will provide tools, hard hats if necessary and a hot drink. Finish around 2.30.

Monday 19 February *(Indoor meeting):* 'Gemstones'. Speaker: Gwyn Green, FGA, DGS. Gemmologist and gemstone collector Gwyn Green has a lifetime of experience in gemmology. Her teaching has inspired many industry professionals and long-term gemstone enthusiasts. A former tutor and examiner for the Gemmological Association, Gwyn was Chairman of the Midlands Branch for ten years. She was also responsible for inauguration of the HND in Gemmology at Birmingham City University School of Jewellery. She is a passionate and knowledgeable speaker about her subject.

Saturday 3 March *(Geoconservation day):* Portway Hill, Rowley. Meet at St Brades Close at 10.30. Directions: from Birmingham New Road (A4123) turn left on to Tower Road if coming from Birmingham, right if coming from Wolverhampton. Just after Bury Hill park, turn left onto St Brades Close. Wear old clothes, waterproofs and stout footwear. If possible, please bring gloves and spades, brushes and trowels. We aim to excavate and expose more of the dolerite. Also bring a packed lunch. Finish at 2.30.

Monday 19 March *(Indoor meeting, 7.00 for 7.30 start):* AGM followed by **Members' Evening: Social, Quiz and Buffet. *This is re-scheduled from 11 December which was cancelled due to weather conditions.*** The Members' Evening is our annual chance to share geological experiences in a sociable atmosphere with a buffet provided by the Society. This year we are venturing into new pastures with a team quiz (with prizes!) rather than the usual short presentations. But please bring along your specimens for admiration, discussion and identification as usual. *(Roy Starkey's scheduled talk on Archival Research is postponed.)*

Saturday 7 April *N.B. Date correction (Field meeting):* Forest of Dean, Soudley Valley and Bixslade Valley, led by John Moseley, Gloucestershire Geology Trust. Meet at Soudley Village Hall (GR 655104) at 10.30. We will follow the Soudley Valley Geology and Landscape Trail (Devonian - Lower Carboniferous). Distance approx. 4 km. Lunch at 1.00 (approx). Option of pub or cafe lunch or bring a packed lunch. Afternoon (2.00 approx): drive to Bixslade Valley (5.6 miles). Parking on the west side of B4234 at the south end of Cannop Ponds (GR 608099). Finish: 3.30 - 4.00 (approx).

Monday 16 April *(Indoor meeting):* 'My favourite science: James Parkinson's *Organic Remains of a Former World*'. Speaker: Cherry Lewis, winner of The Geological Society of London's Sue Tyler Friedman medal. Some of you may know her as a result of her book 'The Dating Game'. She is the author of a recently published book on James Parkinson: 'The Enlightened Mr. Parkinson: The Pioneering Life of a Forgotten English Surgeon'.

Saturday 12 May *(Field meeting):* Calton Hill, Miller's Dale and Tideswell Dale, Derbyshire, led by Mike Allen. Meet at 11.00 in a large car park at the top of the hill on the A6 near Topley Pike GR: SK113725. Drive together to start point, then walk approx 600m to Calton Hill SSSI near Chelmorton. Drive east to Miller's Dale Station car park (small charge). Explore around Ravenstor and Litton Mill (walking approx. 2 miles in Miller's Dale) Bring a packed lunch for picnic at Miller's Dale station (toilets here), or possible pub lunch at the Angler's Rest (may take a while to be served). Possible extension to walk on to Tideswell Dale (time permitting). Easy walking, some steep slopes which might be slippery if wet, some rough ground. Wear suitable outdoor clothing. Finish around 4.30 - 5.00.

Procedures for Field Meetings

Insurance

The Society provides public liability insurance for field meetings but personal accident cover is the responsibility of the participant. Details can be obtained from the Secretary, and further helpful information can be found in the Code for Geological Field Work published by the GA and available on our website. Schools and other bodies should arrange their own insurance as a matter of course.

Health and Safety

If you are unsure about the risks involved or your ability to participate safely, you should contact the Field Secretary. Please take note of any risk assessments or safety briefing, and make sure that you have any safety equipment specified. The Society does not provide hard hats for use of members or visitors. It is your responsibility to provide your own safety equipment (eg. hard hats, hi-viz jackets, safety boots and goggles/glasses) and to use these when you feel it is necessary or when a site owner makes it a condition of entry. Hammering is not permitted unless specific permission has been sought and granted. Leaders provide their services on a purely voluntary basis and may not be professionally qualified.

Other Societies and Events

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

Shropshire Geological Society

Wednesday 14 March: 'Insight to the Black Country UNESCO Geopark project'. Speaker: Graham Worton, project lead for the Black Country Global Geopark project and keeper of geology at Dudley Council.

Some events have an attendance charge, indicated where known. An additional daily membership charge of £3 is levied for attendance by those who are not existing Members of the Shropshire Geological Society. Lectures are generally held in the Conference Room of the Shropshire Wildlife Trust HQ in Abbey Foregate at 7.00 for 7.30. Further info: www.shropshiregeology.org.uk/

Teme Valley Geological Society

Monday 19 February: 'Apps for geology, use of drones etc.' Speaker: Mike Brooks.

Monday 26 March: 'Ancient Plate Margins'. Speaker: Chris Darmon.

Events are held in Martley Memorial Hall. Contact John Nicklin on 01886 888318. For more details visit: http://www.geo-village.eu/ Non-members £3.

Mid Wales Geology Club

Wednesday 14 February: 'The Origins of Atoms'. Speaker: Dr. Geoff Steel.

Wednesday 14 March: 'Cretaceous Fossils, Aripe Basin, NE Brazil'. Speaker: Bob Loveridge.

Further information: Tony Thorp (Ed. newsletter & Hon. Sec): Tel. 01686 624820 and 622517 tonydolfor@gmail.com Website: http://midwalesgeology.org.uk Unless otherwise stated, meetings start at 7.15 (tea/coffee & biscuits) with talks at 7.30 at Plas Dolerw, Milford Road, Newtown.

Warwickshire Geological Conservation Group

Wednesday 21 February: 'The evolution of the dinosaurs'. Speaker: Prof. Richard Butler (Birmingham).

Wednesday 21 March: 'Highlights of the collection of the Geologists' Association'. Speaker: Dr Jonathan Larwood (Natural England).

Doors open at 7.00 for coffee before a 7.30 start at St Francis Church Hall, 110 Warwick Road, Kenilworth, CV8 1HL. For more details visit: http://www.wgcg.co.uk/ or email: WarwickshireGCG@gmail.com. There is a charge of £2.00 for non-members.

North Staffordshire Group of the Geologists' Association

Thursday 22 February at 19.30: 'The origins and evolution of the River Trent during the Quaternary: new insights'. Speaker: Professor David Bridgland, University of Durham.

For enquiries: Steve Alcock, Longfields, Park Lane, Cheddleton, Leek, Staffs, ST13 7JS. Tel: 01538 360431 or 07711 501028. Email: steves261@aol.com More info: www.esci.keele.ac.uk/nsgga/

Woolhope Naturalists' Field Club - Geology Section

Friday 23 March: 'The start of the Cryogenian: Let the Ice Ages begin'. Speaker: Prof. Ian Fairchild.

Meetings normally held from 5.30 in the Councillors' Meeting Room, Committee Room 1 at the Shire Hall Hereford. Guests are welcome (£2.00). Contact Sue Olver. email: susanolver@hotmail.com or visit: http://www.woolhopeclub.org.uk/Programme.html

East Midlands Geological Society

Saturday 10 March at 6.00: 'The real value of microfossils'. Speaker: Haydon Bailey

Non-members are welcome. Further info: www.emgs.org.uk or email: secretary@emgs.org.uk

Manchester Geological Association

Wednesday 21 March at 7.00: 'Carboniferous carbonate platforms: limestone deposition in a changing climate'. Speaker: Lucy Manifold.

Contact email: outdoors@mangeolassoc.org.uk For further information about meetings go to: http://www.mangeolassoc.org.uk/ Visitors are always welcome.

Lapworth Museum Events

Monday 12 February: 'Earthquake hazard: why can't we predict earthquakes?'. Speaker: Dr Joanna Faure Walker, UCL.

Monday 26 February: 'Extinction and Climate Change (title TBC)'. Speaker: Dr Jessica Whiteside, University of Southampton.

Monday 12 March: 'Volcanology (title TBC)'. Speaker: Professor Mike Branney, University of Leicester.

Lectures are usually at 5.00 - 6.00 and all are welcome to attend. There is no admission charge. For more information: http://www.birmingham.ac.uk/facilities/lapworth-museum/events/lectures.aspx

Editorial

Although it was very sad that our December Members' Evening had to be cancelled due to the deep carpet of snow which was covering the West Midlands at the time, the good news is that we have re-scheduled this event to take place immediately after the AGM on 19 March (see programme above). Roy Starkey has kindly agreed to re-schedule his talk on 'Archival Research' to a later date.

BCGS is now on Facebook! We have to thank Committee members Robyn Amos and Chris Broughton for setting this up (see Chris' item below). This follows on from our Twitter account which was established by Peter Purewal in 2016 (see Newsletter 239, October 2016), and our thanks go to Pete for maintaining this. For those of you who are into the world of Social Media please use these facilities as much as you can to promote our Society!

In this issue we have a detailed up-date from Andy on the Wren's Nest, based on the field visit and conservation days last year, plus another fascinating geological travelogue from Mike in his regular feature 'Mike's Musings'. But please especially note Alan Richardson's plea for the Brierley Hill Road Cutting (p.7). I will look forward to receiving your thoughts and comments about this clearly significant, but strangely neglected Black Country geological site, for the next issue of the Newsletter.

Finally, please note that BCGS needs a new Meetings Secretary (see box on p.7). On behalf of the committee I would like to thank Roy Starkey for the splendid job he has done to provide the Society with a superb programme of evening talks over the last year. Not only has Roy found some excellent speakers, but took the trouble to sound us all out in advance so that he could balance the programme in accordance with our preferences. Our indoor programme is fixed up to the April meeting, but we need a new Meetings Secretary in place as soon as possible to take up the mantle and look ahead to the autumn. We need someone to volunteer for this very important role. ■

Julie Schroder

Calling all members!

The Black Country Geological Society is now live on Facebook. To find us just search 'Black Country Geological Society' and hit 'LIKE'. For those without Facebook accounts go to: https://www.facebook.com/pg/BCGeoSoc/posts/

The page will be promoting our events, local activities and related news articles. The page will also give us an excellent opportunity to reach a new audience of potential members, but we need your help! Members can share posts and even invite friends to 'like' the page in order to help our online community to grow. The aim is to become a place not only to promote our Society and increase membership, but to provide somewhere where people can learn something new about the Black Country's amazing landscape and its treasures.

Furthermore, if there's anything which members would like posted, please do let us know at warriors_rugby@hotmail.co.uk or secretary@bcgs.info. This can be a local event, facts, news, photos or even a video. Do not forget we are also on Twitter. ■

Chris Broughton

Vacancy – Meetings Secretary

Our Meetings Secretary, Roy Starkey, will be standing down at the AGM in March. If you are interested in taking on this role, and shaping the future programme of talks, please contact Roy (meetingsecretary@bcgs.info), or any member of the Committee.

The Brierley Hill Road Cutting

B4180, Brierley Hill Road, between Swiss Drive and Ridge Hill

One potentially spectacular geological site in the Black Country has been sadly neglected, and despite its prominent location is steadily disappearing behind a veil of vegetation. I regard it as the single most useful A level teaching locality in the area (including Wren's Nest). At least it can be, if it is properly maintained, and for some years, I have gone out from time to time to clear some of the most important features.

The Brierley Hill Road Cutting

Despite my repeated entreaties, I have never managed to get the BCGS to include the Brierley Hill Road Cutting on its geoconservation schedule. In light of the proposed Black Country Geopark, I thought I could reinforce my argument by researching the status of this valuable site. I scoured the internet for any mention of the cutting: not one of the following sources made any reference to it.

The GeoConservationUK flier

- West Midlands Geodiversity Partnership: 'Sites worth visiting in the Black Country'
- BCGS: 'Local Geology Sites'
- GeoConservationUK
- Black Country Geopark: 'Sites to see'
- Black Country Global Geopark Project European and Global Geopark Network Application Dossier: 'Geosites of the Proposed Black Country Global Geopark and their Stratigraphy.'

The irony of this omission is that a photograph of this exposure has been used as the cover picture for the GeoConservationUK flier, with the caption, 'Triassic Sediments folded up against the coalfield boundary fault, Wordsley, near Stourbridge.' The leaflet is not a local production; it is about geoconservation nationally, and includes information on Geodiversity, Local Sites, Local Geoconservation Network, Choosing Local Geological Sites and Geodiversity Action Planning. Of all the sites of geological interest in England and Wales, this is the one deemed sufficiently worthy to feature on the cover of this document, and yet it seems to have been otherwise erased from the geoconservation literature. ►

The BGS online geology map identifies the rocks exposed here:

Bedrock geology description: Chester Formation (formerly 'Kidderminster Conglomerate') - sandstone and conglomerate, interbedded. Sedimentary bedrock formed approximately 247 to 250 million years ago in the Triassic Period. Local environment previously dominated by rivers.

Setting: Rivers. These sedimentary rocks are fluvial in origin. They are detrital, ranging from coarse- to fine-grained and form beds and lenses of deposits reflecting the channels, floodplains and levees of a river...

More details can be found: http://www.bgs.ac.uk/lexicon/lexicon.cfm?pub=CHES

The main exposure is packed with interesting features, allowing the novice geologist to assemble a wealth of data, sufficient to produce a worthwhile geological history and environmental interpretation.

The nature of the fault is readily interpreted, and the displacement is easily measured.

The red sediments speak of continental deposition. The well rounded clasts suggest prolonged transportation of materials from an area that had been subjected to metamorphism. The matrix contains aeolian grains that can be linked to earlier Permian deposits. Some beds are continuous across the outcrop, others are lenticular. Evidence of groundwater evaporation is provided by a prominent calcrete (hard ground) in which the bright white calcite cement provides a convincing reaction with hydrochloric acid. Palaeocurrent directions can be interpreted from imbricated pebbles and cross-bedding, the latter also offering confirmation of the younging direction. Moving up-sequence, westwards across the outcrop, grain sizes decrease: the upward-fining nature of the sequence reinforces the fluvial interpretation applied to the exposure. As well as having been tilted, the rocks are cut by several fractures, giving evidence of at least two episodes of faulting: one extensional, and one compressional.

Proceeding eastwards along the A4180, beyond the prominent exposure, a few hundred metres takes you over the Bridgnorth Sandstone, the Clent Formation, and the Enville Member before crossing from the Permian to the Carboniferous and reaching the Etruria Marl at the edge of the coal field.

Continental deposits are probably the easiest for non-geologists to understand, so not only is this a wonderful teaching resource, but it also provides a superb opportunity to improve public understanding of our subject. It just so happens that a grassy area across the road from the outcrop provides a safe area in which students can draw field sketches, and also offers the perfect location for a permanent interpretation panel (*see front cover photo*).

Why is it not a designated site? Why does it not feature in the Black Country Geopark plan? Why is it not being energetically conserved? If anyone knows, perhaps they will submit a response to the newsletter. If nobody knows, then perhaps we should do something about it. ■

Alan Richardson

Field and Geoconservation Meeting Reports

Saturday 12 August 2017: Wren's Nest Field Visit. Led by Graham Worton (BCGS and Dudley Museum & Art Gallery).

Introduction

Miners' Memorial near Seven Sisters viewpoint

Our Wren's Nest visit last August was an update to ongoing work and research. We were unable to meet at the Warden's base due to road works, so at 10.30 we met at the Caves Pub car park instead. After a brief introduction to the reserve Graham explained what our visit would involve. We would follow the 'Geological Trail', heading eastwards from the pub along and across Wren's Nest Road to the Snake Pit, then back across the road to the NCC (Nature Conservancy Council) cutting. Next we would leave the Trail and head southwards over the summit of Wren's Nest Hill, passing the old farm site on the way to the Murchison View Point and Seven Sisters Caverns. We would rejoin the trail at the Murchison View Point and head north along the western limb of the hill to the quarry viewpoint, the 'Ripples Through Time' lookout, and the main patch reef. Our trail would end at the viewing platform over the Ripple Beds.

On the way round, Graham talked about using the rocks and landscape to demonstrate basic geological principals, how to read and interpret the rocks, the ongoing research, and the importance of the Reserve. Wren's Nest acts as an important educational tool, with an equally important interaction between the Reserve's geology, heritage, people and wildlife.

Geology and Industrial History of the Wren's Nest

The link between the Wren's Nest Nature Reserve's geology and people dates back to prehistoric and medieval times, or possibly before. Wren's Nest Hill sits on a ridge of high ground that forms the watershed of Central England. According to archaeological evidence, the ridge formed an important communications route between the north and south going back to prehistoric times. Indeed the Reserve's very name comes from the Anglo-Saxon word 'Wrosne' meaning 'The Knot', as in tying together the north and south.

Working of the Wren's Nest limestone dates back to the medieval period. Heating limestone to produce lime dates back to the 1500s. The lime was used on the low-lying fields around Dudley which are underlain by Lower Coal Measures strata. The lime helped to break up the clay-rich soils, improving the drainage and neutralising their acidity in a process known as 'sweetening'. Early lime making involved burning limestone in open pits to make 'lime pies' prior to the later introduction of lime kilns. Examples of these can be seen around the Reserve. Jointing of the Upper and Lower Quarried Limestones produced ideal brick-sized building blocks as used in the construction of the Dudley Castle and Priory.

From 1619 onwards the 8th Earl of Dudley, resident at Dudley Castle, was using coal as fuel, and lime as a flux for smelting iron. He published this process in his book Metallum Martis in 1665. The so-called 'Father of the Industrial Revolution', Abraham Darby was born in 1678 at the family lodge, formerly ►

located adjacent to the Snake Pit, and he would eventually marry into the Earl of Dudley's family. So when Darby launched the Industrial Revolution from Coalbrookdale in 1709, it could be said that his skills and knowledge started in the Black Country, if not the Wren's Nest.

Early mining methods relied on chasing the limestone beds along the limbs of the hill. The result was two necklaces of trenches ringing it, such as those seen at the Snake Pit and the Ripple Beds. Steepening strata and groundwater later led to a change in mining practice using pillar and stall methods that left the legacy of caverns, including the Seven Sisters. At the height of production, over 90,000 tonnes of limestone was being extracted from Wren's Nest and Castle Hill annually.

It was the miners supplementing their income through the sale of fossils that brought the rocks of Wren's Nest and Dudley to the attention of Sir Roderick Impey Murchison. Referred to as the 'David Attenborough' of his day, Murchison visited the region in the 1830s, getting to know the miners, buying specimens from them and producing his book, 'The Silurian System', which was published in 1839. The book was launched in Dark Cavern beneath Wren's Nest, to a learned audience that included Sir Robert Peel and the Bishop of Durham. Murchison's wife, Charlotte, illustrated the book and her illustration of the scene overlooking Dudley, Castle Hill, the Rowley Hills and out towards Birmingham can be seen on the interpretation board at Murchison's View Point. Murchison felt that this view was a good expression of how geology affects the local landscape. When he returned to give a speech in Dark Cavern ten years later, over 15,000 locals got wind of this and turned up to listen. Afterwards, local miners hoisted Murchison onto their shoulders and out of Dark Cavern, putting a wreath on his head and crowning him the 'King of Siluria'.

Charlotte Murchison's illustration from the board at Murchison's View Point

It was through Murchison that the Dudley collection of fossils was assembled and the Dudley and Midland Geological Society was established in 1842. The Society was the first of its kind in the Midlands and of course was the precursor to the BCGS. Fossil sales put Dudley on the map and the Bentley Directory of 1850 records the presence of three shops selling fossils in Dudley town centre. These include the ever popular Dudley Bug, '*Calymene blumenbachii*', which can be found in collections and books both nationally and globally.

In 1924, mining at Wren's Nest ceased leaving behind a sculpted landscape of trenches, pits and caverns that are testament to the interaction between people and the site.

Glacial activity during the Ice Age has removed the top of the Wren's Nest Hill, leaving behind a relatively flat plateau. Human hands have since shaped the plateau into the fields belonging to the old farm, only the ruins of which survive today. To the north of this, adjacent to the former Mons Hill College, are a series of man-made terraces once used as a rifle range during the First World War.

The historical use of guns on Wren's Nest could end in tragedy, as one newspaper article in the Dudley archives records. On 7 September 1891 a 50-year-old miner, James Elwell, left his house on Oak Street, Coseley for work. At the same time, just over half a mile away on Wren's Nest Hill, Samuel Whitehouse was discharging his Martini-Henry rifle after obtaining ball cartridges to shoot birds. Unfortunately, a stray discharged ball cartridge ended up travelling over 700m and ripped straight through James Elwell killing him instantly. ►

Following the end of the Second World War, Dudley Council was looking for green spaces where local people and returning troops could fine peace, reconciliation and inspiration to escape the recent horrors. Already a natural treasure for its rocks and fossils, Wren's Nest stood out as somewhere important and worth protecting. Therefore, in September 1956 it was awarded the status as the world's first National Nature Reserve to honour the engagement of people with science. Since then it has been nominated as a Site of Special Scientific Interest (1991) and along with Castle Hill a Scheduled Monument (2004).

Recent past, present and future of the Wren's Nest

Until recently the Wren's Nest Hill summit was used as playing fields for the former Mons Hill College, which started life as a school in 1965. In 1990 the school became a vocational college and the site is currently being redeveloped into a housing estate.

Wren's Nest Hill Summit

Not all the depressions and holes seen at Wren's Nest are former mine workings. The 'Cherry Hole' and 'Fish and Chip Hole', adjacent to the old farm ruins, are examples of features dotted across the Reserve known as 'Crown Holes'. These represent collapses of the underlying caverns and old mine workings. Collapses have been recorded since 1880 with the most recent occurring within the Seven Sister's Caverns in 2004.

Graham reminded us of how in the past local people would go down into the disused caverns and depressions with no concerns for health and safety. In 1961, the death of a local lad, Royston Bate, prompted Dudley Council to take action. Viewing caverns such as the Seven Sisters as dangerous places to go, they attempted to seal them up using dynamite. At the Seven Sisters they were only successful in destroying two of the seven exterior pillars that gave the caverns their name, and the explosion caused collapses elsewhere on the reserve. The timing of the work was also unfortunate as it was undertaken at 10.00pm and scared the locals half to death. After the collapses within the Seven Sisters of 2004, the lower caverns were sealed for good and the caverns filled with Rowley dolerite.

Today, conservation of geology, industrial heritage and wildlife is what the Wren's Nest is all about, and palisade fencing helps to stop members of the public going where they shouldn't. Through conservation the site can continue to be used for educational purposes, inspiration and a place to relax. Conservation has been ongoing for some time. The NCC cutting, which we passed through after the Snake Pit, was excavated in 1977 to provide an easier and safer way to study the strata sandwiched between Upper and Lower Quarried Limestone beds.

Improving access, providing interpretation panels and creating the new trails with large sculptures around the reserve, all formed part of the 'Ripples Through Time Project' (2008). The lookout at Murchison's View and the Quarry Viewpoint were both improved as part of this project, which also included the creation of four new trails. These are: the 'Wren's Nest Highlights Trail', 'Wild Wrosne', 'Murchison's Walk' and 'Abraham Darby's Walk'. Each explores the geology, wildlife and industrial heritage of the reserve. *(See Newsletter 209, October 2011, p.5 for a report on the 'Ripples Through Time' launch event.)* Old concrete bollards around the ruins of the farmhouse are testament to an earlier trail that Graham remembered dated back to 1967, but the details of this are long forgotten. ►

The 'Strata Project' (2007) came on the back of the 'Peoples 50 million' lottery funding bid of the same year. This project centres on making the caverns and subterranean spaces stable and safe, with the view of opening them up to the public in the future. The project is too big to be done in one go, and has therefore been subdivided into smaller 'bite size' chunks. Stabilizing of the Seven Sisters caverns has been completed, and involved re-housing the Reserve's population of bats. The 'Ripples Through Time Project' also formed a smaller part of the Strata project.

In 2008 the 'Wrosne Project' was undertaken to educate local children about the geology of the reserve and its importance *(see Newsletter 195, June 2009 p.3).* The culmination of this was a performance in the Singing Cavern by local school kids. The Reserve has been used as a local playground for decades and as a consequence is renowned for anti-social behaviour. However, with projects such as Wrosne to get local kids involved with the Reserve, levels of anti-social behaviour have seen a decline. Noticeably, any sculpture designed by local people such as the trilobite seat and 50th anniversary mural at the Snake Pit, do not appear to get vandalised.

The wardens are working hard to create new habitats for wildlife, some of which is unique in the Birmingham and Black Country region. This has included creating grassland meadows and hedgerows on the hill summit where the farm and the rifle ranges once stood. Graham is keen that collectors of fossils should label and identify them, to record where they came from. It is hoped that this exercise will reveal differences between the species living on the patch reefs and those on the seabed.

(You can see many photos of the Wren's Nest both past and present on the BCGS website here. Ed.)

Saturday 16 September 2017: Wren's Nest Geoconservation Day. Led by Ian Beech (Wren's Nest Warden).

The day was mild with a mixture of cloud, sunshine light winds and sporadic showers. The Warden's base was once again accessible following completion of road works, and we met there at 10.30.

Wren's Nest after clearance

We spent the day in the former trench on the western side of the Reserve between the quarry viewpoint to the north, and the Seven Sisters Caverns to the south. Two large limestone rock buttresses here were all that remained of the two Seven Sisters columns that the Council blew up back in 1961. The wardens want to clear this space to open up the view from the Seven Sisters Caverns, northwards past the quarry and up towards the Caves Pub on Wren's Nest Road. We started the clearance of ash, hawthorn, elm, bramble and other undergrowth that was choking the trench. It is hoped that opening up this area will also create new grassland habitats for wild flowers and a corridor for butterflies, linking the northern and southern ends of the Reserve.

I would like to thank Graham and the Reserve Wardens for another two very interesting and enjoyable visits to the Wren's Nest Reserve and hope we will see more members at the planned conservation day on 10 February. ■

Andy Harrison

Mike's Musings No. 13

Czech these out – with general thoughts on foreign exploration

Regular readers will have gathered from my varied articles in previous newsletters that I am wont to roam around destinations on the Continent that may reasonably be reached by car - far less hassle, in my view, than air travel, and preferable in some respects to organised tours with rigid itineraries that leave little or no opportunity to explore at will. One of my more random tours last summer took me across the Low Countries, Germany and into the Czech Republic. I had few specific targets in mind other than to revisit places I had seen previously in a non-geological context, around 35 years ago (when it was called Czechoslovakia).

Jáchymov Museum, the former Royal Mint.

Understandably, Prague is a popular destination for those who like to visit cities of historical and cultural interest. However, there is much for the geologist to see in the surrounding region (by which I mean much of Bohemia), if you also like to see a bit of the countryside too.

Entering the Czech Republic from the German side of the Erzgebirge (Ore Mountains), the first place of note is Jáchymov (also known as Joachimsthal by the German speaking population). This lies in the centre of an area with a chequered mining history which was dominated by silver from the 16th to 19th centuries, along with bismuth, cobalt and nickel, as uses for those metals were discovered. Later on, uranium and associated elements took on greater importance as the potential of radioactive elements became better understood, including a short-lived, and misguided, flirtation with radon therapy during the early 20th century. Jáchymov also is famously associated with the Curies, who first isolated both radium and polonium from local uranium ores. Mining ceased in 1964, so all that remains is an excellent museum (housed in the former Royal Mint) detailing this history, together with a fine mineral collection.

Bubbling 'moffettes' in the Ohre (Eger) rift zone at Soos

The north-west corner of Bohemia is also associated with a number of other spa towns thanks to the remnant hydrothermal activity associated with Cenozoic volcanism. The main centres of health giving thermal waters were Karlovy Vary, Františkovy Lázně and Mariánské Lázně (Karlsbad, Franzensbad and Marienbad), and several such wells can still be sourced in each of these towns, some of which certainly have a distinctive flavour! Mofettes (bubbling cold mud pools releasing carbon dioxide) can be seen in several localities, but the nature reserve of Soos, in the Ohre (Eger) Graben (rift structure), is the best known, and something of a tourist attraction. Sometimes these occur as coldwater geysers – and one such is housed in a colonnade in Karlovy Vary. Another remnant of volcanic activity may be seen at Komorní hůrka (Chamber Hill) which consists of a scoria cone with a fairly obvious crater-like form. ►

North of Prague there is an area known as the Elbe Sandstone Region, which extends across the border into former East Germany. Not far from the town of Děčín one can explore the wonders of the table-land composed of this late Cretaceous stratum, in places deeply dissected into a tangle of deep and narrow gorges, rock pillars and spires (not unlike the Brimham Rocks in Yorkshire for anyone familiar with that location). Two areas, the Tiské Stěny (Printed Walls) and the Děčínský Sněžník (Snowy Mountain), are especially noteworthy, with fine tafoni weathering, sedimentary structures, bioturbation and occasional plant fossils.

Erosion forms in the Elbe Sandstone, Tiské Stěny

So much for nature's architecture. If it's human architecture that interests you, then Kutná Hora, some 60km east of Prague, doesn't disappoint. Of particular interest are the UNESCO listed St. Barbara Cathedral, the Jesuit College and the Sedlec 'Church of all Saints' (with it's rather bizarre and discomforting Ossuary chapel).

Kutná Hora necessitated an impromptu diversion to Práchovna Quarry in the suburb of Vrchlice, to see the celebrated unconformity between late Proterozoic basement gneisses and the unusual (to British eyes) overlying littoral Cretaceous deposits (where we might expect chalk). This well laid out former quarry, complete with a fine selection of large boulders of local rock types, displayed the unconformity in all its glory. It's not every day you find an almost billion-year time gap laid out for you in such fine style. The Cretaceous beds are represented here as coarse calcareous glauconitic sandstones (apparently with an impressive basal boulder conglomerate in places elsewhere). These, like the Elbe Sandstone, were deposited in the same 'Czech Cretaceous Basin' which lapped against the margins of a 'proto-Rhenish/Bohemian' landmass on the northern flank of the Tethys Ocean.

The Upper Cretaceous/Proterozoic unconformity and boulder display in Práchovna Quarry

But the most important sites, perhaps, are associated with the Berounka, the main river of eastern Bohemia after the more famous Vltava, with which it unites just south of Prague. This area was made famous by an 'incomer', the French engineer Joachim Barrande, who studied in particular the stratigraphy and fossils of the Palaeozoic outlier south-west of the capital city (sometimes referred to as the 'Barrandium'). In some respects Barrande could be thought of as the 'Czech Murchison', whose great work on the Silurian system inspired his own studies. The villages of Skryje and Tyrovice were the centre of Barrande's area of interest, and the former has a small museum in his honour, displaying some of his finest specimens and explaining his life and work by way of a multilingual audio-loop. A geological trail can also be followed, and although I didn't come away with armfuls of fossils, I did come away with a clearer appreciation of the geology. Skryje lies within the Cambrian part of the sequence, with the Precambrian/Cambrian boundary near Tyrovice just a short drive to the north. ►

A section of Middle Cambrian on the Skryje Geology Trail

Further afield, but still within the 'Barrandium', are several other geological 'opportunities' within the remainder of the Palaeozoic sequence, especially in the Silurian and Devonian. There are many quarries, old and new, though most are out of bounds to itinerant visitors. Fortunately there are also plenty of river cliffs, road cuttings and a show cave (at Koněprusy) that can be examined. Also, not uncommonly, one comes across information boards offering geological detail - but mostly in Czech.

The Silurian looks much the same as one would find in the Welsh Borders, and has many fossils in common. The Devonian is less familiar to the British eye, being far more marine in character, with massive limestones not unlike those around Torbay and Plymouth, in which fossils are less easy to find or extract. Two locations are however of some historical interest and importance in that they provide the internationally recognised 'golden spike' chronostratigraphic boundary markers. Near the wonderfully named hamlet of Klonk there is a tall column bedecked with detailed information concerning the Devonian/Silurian boundary at 'Bed No. 20' seen half-way up a nearby quarry face (and quite inaccessible to ordinary mortals!). This spot, ratified by the international stratigraphic boundary commission in 1972, is the outcrop chosen to represent the global 'type boundary section' for this particular point in the geological record. Not far away at Karlštejn is an auxiliary section for the same piece of geological real estate labelled 'Bed No. 41' here. Located right by the roadside, this latter section is much more accessible, and yielded a few weathered-out fossils (especially orthocones, which are not uncommon in these parts). This section is altogether more exciting, with clear evidence of the folding and small scale thrusting associated with the Variscan Orogeny. The photo *(above)* shows the GSSP *(Global Boundary Stratotype Section and Point)* on the appropriate bedding plane (base of Devonian).

The Devonian/Silurian boundary auxiliary stratotype at Karlštejn

Karlštejn Castle, atop a crag of Devonian/Silurian shales and limestones

Karlštejn also has a very imposing castle set high on a crag further along the road, but is surrounded by a lot of tourist 'tat' cashing in on the association. The castle dates from 1342, built for Charles IV, and houses much of the royal regalia, so might be considered the Czech equivalent of the Tower of London. Splendid indeed are the views both of and from this imposing landmark! ►

Now that's what I call a trilobite!
Skryje Geology Trail

Overall, the most obvious difficulty in understanding the geology of Bohemia is the language problem – museum displays and information boards, as well as technical publications when researching the internet, are, not unreasonably, in the Czech language, which is not the easiest for the British speaker to penetrate! However, the diagrams can often convey the gist of an explanation. Some perseverance can also produce results with the help of translator websites (as well as providing mirth when things are 'lost in translation')!

This has been a fairly random account of a poorly planned tour; quite often individual destinations came along without much aforethought, and often quite by accident. I haven't mentioned the few wild-goose chases along the way that led to very little, but part of the fun for me is the serendipitous discovery. I am quite sure that there are more constructive ways to learn about the geology of distant lands, and there are always things you realise you have missed once it's too late, but which make a good excuse for hoping to return one day – and even occasionally actually doing so.

What does come across quite forcibly on my foreign forays, however, is just how universal (or should I say global) geology really is – after all, a granite is a granite, a fault is a fault, and columnar cooling joints are much the same, wherever they occur. It is only the local context that might be more difficult to divine. But one can get a little too blinkered just looking at the British scene, wonderfully varied and comprehensive though it may be. And foreign travel of any kind helps one to understand the world we live in, and each other, just a little bit better. ■

Mike Allen

Members' Forum

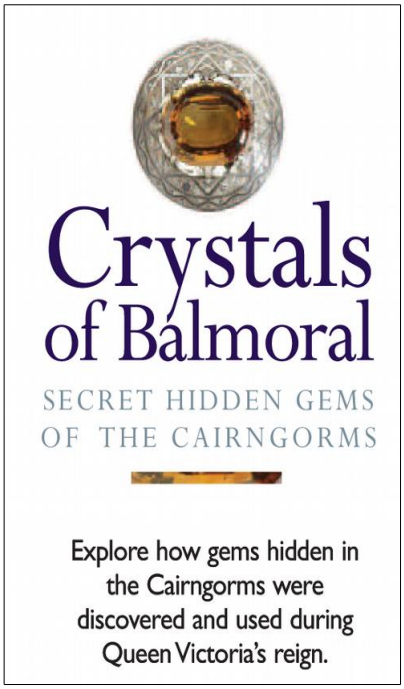
Crystals of Balmoral

Secret Hidden Gems of the Cairngorms - New Exhibition

I am working with Gary Marsden, Visitor Enterprise Manager for Balmoral Estate, to put on an exhibition of mineral specimens, jewellery and artefacts, from the collection at Balmoral Castle.

The Castle, and exhibition, will be open to visitors from 30th March to the end of July 2018.

The exhibition, in the Ballroom at the Castle, will offer a unique opportunity to see the large smoky quartz crystal found by James Grant in 1851, and presented to Queen Victoria, together with a selection of other fine specimens, some rough pieces of fabulous gem quality 'cairngorm', specimens collected by Queen Victoria herself, from Beinn a' Bhuird, and three of the largest beryl crystals ever found in the Cairngorms. ►



Balmoral Castle

Another notable item of interest is the elaborate Atholl Inkstand, designed by Prince Albert as a gift for the Queen at Christmas in 1845 (see www.royalcollection.org.uk).

If you are in the area, don't miss this one-off chance to see these historical treasures.

For reasons of copyright, it is unfortunately not possible to reproduce sample images here, but you can see some of the specimens in my book Crystal Mountains – Minerals of the Cairngorms, published in 2014 (see pages 53, 59, 60, 64, 67, 71 and 72). ■

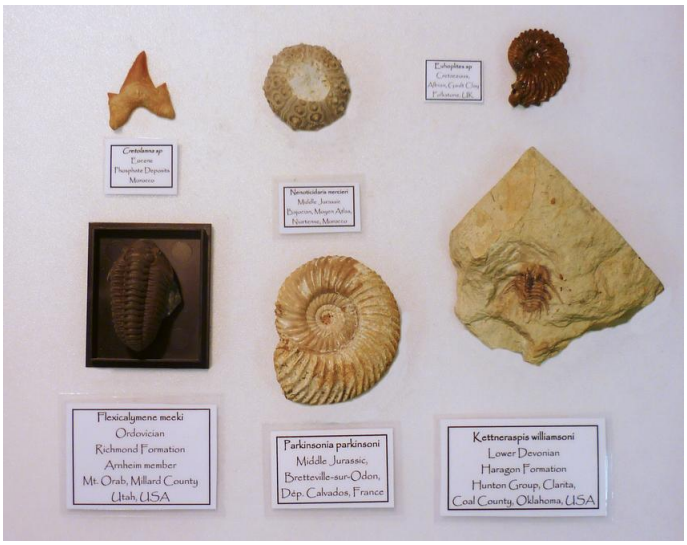
Roy Starkey

Collection of fossils donated to the Society

BCGS member, Steven Birch has very generously donated a further suite of fossils to the Society collection. The twenty specimens are beautifully prepared examples, including trilobites, gastropods, ammonites, teeth and bone-bed material, from both British and foreign localities. Each specimen is properly curated, with full identification and locality details. The accompanying photo illustrates a selection of just half-a-dozen examples.

Thank you Steven! ■

Roy Starkey



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