



Newsletter No. 266

April 2021

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Committee

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Graham Worton

Vice Chairman

Andrew Harrison

Hon Treasurer

Alan Clewlow

Hon Secretary

Position vacant

Field Secretary

Andrew Harrison

Meetings Secretary

Keith Elder

Newsletter Editor

Julie Schroder

Social Media

Peter Purewal

Robyn Amos

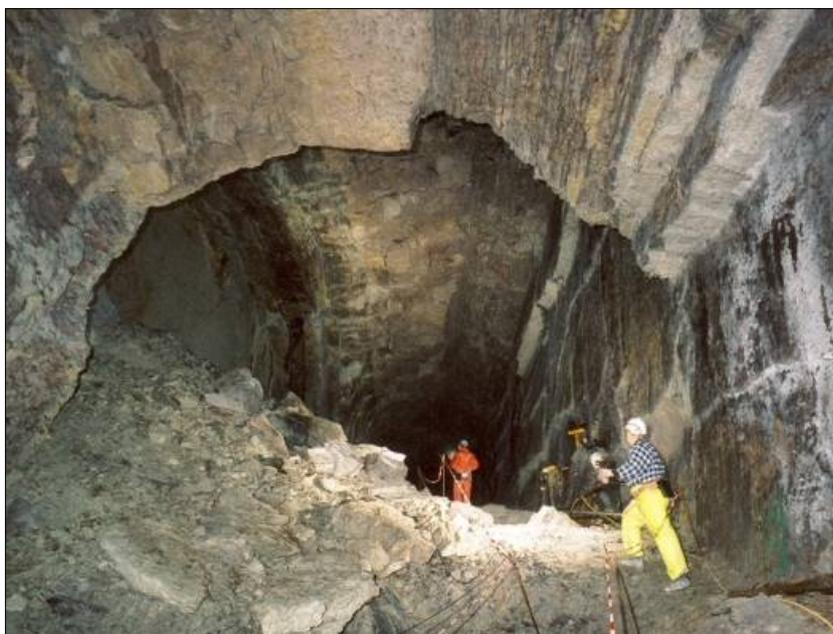
Webmaster

John Schroder

Other Member

Bob Bucki

To find out more about this image - read on!



**Copy date for the
next Newsletter is
Tuesday 1 June**

<p>Position vacant Honorary Secretary,</p> <p>secretary@bcgs.info</p>	<p>Andy Harrison, Field Secretary,</p> <p>☎ 07973 330706</p> <p>fieldsecretary@bcgs.info</p>	<p>Julie Schroder, Newsletter Editor,</p> <p>42 Billesley Lane, Moseley, Birmingham, B13 9QS.</p> <p>☎ 0121 449 2407</p> <p>newsletter@bcgs.info</p>
<p>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 more information see our website: bcgs.info, YouTube, Twitter: @BCGeoSoc and Facebook.</p>		

Future Programme

Indoor meetings are normally 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. The same timing applies to the current programme of online 'Zoom' meetings.

Visitors are welcome to attend BCGS events.

Monday 19 April (Zoom Meeting): Speaker: Dr Stephen Knipe in London, Ontario. This talk comes to us live from Canada! Gold has been the lure which has attracted many to North America to prospect for gold. Dr Stephen Knipe will tell us about gold and other metal ore samples which are sent to AMTEL (Advanced Mineral Technology Laboratory) from major mines around the world where they are analysed for the chemical and mechanical processes needed to recover and separate the metals. AMTEL was formed through a multi-million dollar initiative, sponsored by a consortium of eleven mining companies based in Canada and worldwide.

Future plans for Field and Geoconservation Meetings

Over the past twelve months the Covid-19 pandemic has inhibited field events from taking place. As the Government's 'Roadmap Out of Lockdown' unfurls we have ideas for some possible summer events following Covid safety guidelines. Events being considered include a joint group canal boat trip into the Dudley Caverns looking at the Silurian geology and historic workings. We are also considering shorter, possibly evening visits, to the local Geopark sites to see what they have to offer and how BCGS members can be involved with improving and maintaining the sites. We intend these events to be more social, with each finishing at local pub for refreshments afterwards.

We will have to restrict attendee numbers for these events, so it is imperative that members sign up beforehand. We cannot guarantee a place for those who do not pre-book. We will ensure that Covid safety measures are put in place for each event and look forward to getting back out on site. We will notify you as soon as we have any further information.

Andy Harrison

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

Covid-19 arrangements

Some societies have cancelled their meetings for the foreseeable future. Many are running virtual on-line meetings. Below is a list of the societies whose events we normally promote in this Newsletter. Please check websites for further information.

Shropshire Geological Society

Wednesday 14 April: AGM followed by 'Adventures Under The Microscope'. Speaker: Martin Carruthers.

Wednesday 12 May: 'Provenance (searching for the source) - using microfossils'. Speaker: Haydon Bailey, University of Birmingham.

Lectures are being held using Zoom and commence at 7.00 for 7.30. Further info:
<http://www.shropshiregeology.org.uk/SGS/SGSEvents.htm>

The Geologists' Association - Geology from your Sofa

The Geologists' Association may not be able to invite you to attend lectures and field trips at the moment, but they are looking at ways for you still to enjoy geology, virtually through online courses, field trips and talks.

See the website for further details: <https://geologistsassociation.org.uk/sofageology/>

Geological Society, West Midlands Regional Group

Tuesday 13 April: 'Midlands Ice Age Geoheritage and Birmingham's Remarkable Erratic Boulders'. Professor Ian Fairchild (University of Birmingham).

Tuesday 11 May: 'What is a Geological Disposal Facility'. Jonathan Turner (Radioactive Waste Management).

Lectures are being held using Zoom and commence at 6.00 for 6.30. For further details please contact the Group Secretary at: geolsoc_wmrg@live.co.uk Click [here](#) for website.

Mid Wales Geology Club

Wednesday 21 April: 'Shallow Geothermal Energy in Cities'. Speaker: Ashley Patton, Engineering Geologist, BGS Cardiff.

Wednesday 19 May: 'Introduction to the Geology of El Heirro'. Speaker: Chris Simpson.

Further information: Tony Thorp tel. 01686 624820 and 622517 tonydolfor@gmail.com
Web: <http://midwalesgeology.org.uk> lectures start at 7.15 via Zoom.

Lapworth Museum's Black Country Geopoetry Workshop

Thursday 15 April, 6.00 - 7.00: Lapworth Museum's '**Black Country Geopoetry Workshop**', to be presented on-line on by BCGS Poet in Residence, R. M. Francis. Using 3D images of fossils found in Dudley and Coseley, Rob will be waxing lyrical about the region's geology and how we can use it in creative ways. Here is the link for more information and to register: [Geopoetry Workshop](#).

Warwickshire Geological Conservation Group

Wednesday 21 April: 'Henry Clifton Sorby, Microscopist & Geologist - Sheffield's Greatest Scientist'. Speaker: Noel Worley.

WGCG Geology Free Talks: Wednesdays 7.30 via Zoom. For more details visit: <https://www.wgcg.co.uk/> or email: warwickshiregcg@gmail.com

Abberley & Malvern Hills Geopark - Geofest

The Abberley and Malvern Hills Geopark Forum will once again be running their three-month summer GeoFest from 29 May to 29 August 2021. The Geofest will include self-led geology and landscape trails and activities for all around the Abberley and Malvern Hills Geopark promoting its geology, heritage and wildlife. Further information about the Forum and the 2021 Geofest can be found on the Abberley & Malvern Hills Geopark website at <http://geopark.org.uk/>.

Check websites for the following societies:

Teme Valley Geological Society: <http://www.geo-village.eu/>

Woolhope Naturalists' Field Club - Geology Section: <https://www.woolhopeclub.org.uk/meetings>

East Midlands Geological Society: <http://www.emgs.org.uk/>

Lapworth Lectures: <https://www.birmingham.ac.uk/facilities/lapworth-museum/events/lectures.aspx>

Herefordshire & Worcestershire Earth Heritage Trust: <https://www.earthheritagetrust.org/>

BCGS Committee - vacancy for Honorary Secretary

The Committee meets about 4 times a year to discuss all matters concerning the Society, and particularly to forge together our programme of events. The Society can only thrive with the efforts put in by the Committee behind the scenes, and we are always looking for new ideas. There is **still** a vacancy for the post of Honorary Secretary, and we urgently need someone to fill this post. If you are interested, or would like more information about the work that this entails please don't be shy to put your name forward! Please use the email address secretary@bcgs.info if you are interested.

Editorial

With just one more indoor meeting arranged by the Society before the summer season, we can assure you that Committee members are busy behind the scenes with cautious planning for some Covid safe summer activities, and discussion about the timing for resumption of indoor meetings at the Dudley Archives. There is still too much uncertainty for any definite plans, but we will contact you as soon as we have any firm news of forthcoming activities.

In this issue we have included a fairly detailed summary of this year's AGM, to make sure everyone is up to date with the current state of the Society's affairs in spite of our rather nebulous channels of communication over the last year. We welcome another new member, Mike Byrne, and bring news and a thought provoking geo-poem from our Poet in Residence, Rob Francis.

Our November 2020 talk on Wren's Nest and Saltwells brought us into contact with Tony Mellor, and as a result of this we have a fascinating report of Tony's engineering involvement with the stabilisation work around the Wren's Nest in 2001/02. Tony's article contains some fascinating photos of this time, and he has kindly sent us lots more. These will be added to the photo archive on our website in due course.

From Matt Sutton we have the second instalment of the series of 'Matt's Maps', this time focussing on Sedgley Beacon and Coseley Cutting. After each instalment has appeared in our Newsletter, Matt's Maps will be added to the relevant page on our website. You can now see Matt's Wren's Nest maps by going to our website and following the links to 'Local Geology Sites': [1. Wren's Nest National Nature Reserve](#)

We have another delightful 'Musing' from Mike and finally, remember that you can re-visit most of our previous on-line talks on our [YouTube channel](#). Please send the link on to others to spread the word about BCGS as widely as possible! ■

Julie Schroder

Annual General Meeting

The 2021 AGM was held on-line on Monday 15 March. Below are summaries of the Treasurer's and Chairman's reports and election of officers.

Treasurer's Report

The Society began the year 2020 with a clear issue in terms of its finances. While we possess large cash reserves (built up as savings over many years), more recent falling membership and the income generated by annual subscriptions and donations has not been meeting our expenditure / running costs. This resulted in a net deficit of £328 in the year 2019 (Jan 1st to Dec 31st). By the end of 2020, however, the situation had completely changed, last year producing a net surplus of £215. This boosted the total assets held by the Society at the end of 2020.

The main reason for this positive about-turn has been the Covid-19 pandemic. The Society only held two indoor meetings in 2020 (in January and February), before the first Lockdown was imposed. Since then, meetings have been 'Virtual' via Zoom, with no need to pay for room-hire fees at Dudley Archives (which has long been our main annual expenditure), or lecturers' travelling expenses. Of course, it is the Society's intention to resume 'live' meetings as soon as possible, but this financial bonus should keep our finances in a healthy state for at least the next two years. Indeed, with our large reserves, the Society could sustain a moderate annual deficit for several years into the future. Ideally, we would hope to increase membership and income to balance our finances, but at the moment, the committee sees no need to increase annual subscription rates.

The 2020 balance sheet shows our total income down £166 from 2019. Most of this income came from subscriptions, which amounted to only £20 less than the previous year. The big difference came from donations. These come mainly from money given at indoor meetings for tea / coffee and sales of second-hand books, maps etc. donated by members. With only two indoor meetings in 2020, this income source dried up.

Looking at annual expenditure, this saw a massive drop of £711 between 2019 and 2020, mainly due to room-hire and lecturers' expenses being sharply reduced. Other expenditure in the year included: our annual insurance arranged through the Geologists' Association; our affiliation fee to the GA; annual subscriptions (mainly for 'Down to Earth'); website and newsletter expenses, and the cost of refreshments at our Members evening in December 2019 (paid in 2020). All these payments were broadly in line with those of the previous year.

Most of our reserves were held in a Nationwide BS savings account. We received notification from the Nationwide in November that they were closing all 'Treasurers Trust' accounts, which included our own. As a result, we have closed that account and transferred the balance into one of our BCGS Lloyds Bank accounts, so all our reserves are now held in accounts at Lloyds Bank.

It has been pleasing to note that, despite the pandemic, our membership numbers in 2020 reversed the trend of recent years and saw a slight rise. Although, as might be expected, some of our members did not renew their subscription, we recruited a number in the autumn, possibly due to details of our 'Zoom' lectures being widely circulated to other local societies. ►

Once again, I and other committee members must offer our thanks for the work done by BCGS member Davena Dyball in auditing / examining our accounts and producing the spreadsheet breakdown for our 2021 AGM.

Alan Clewlow, BCGS Hon. Treasurer

Chairman's Report

This year's report emphasizes adaptation and resilience in the face of adversity. The Chairman expressed pride in the members and committee for keeping BCGS events happening, but looks forward to resuming meetings and trips again.

2020 saw the sad loss of Alan Cutler, founder member and former Chairman of the Society. He had an enormous impact on the world of local geology and its conservation, and will be greatly missed.

Wonderful things also happened in 2020. In July the Black Country formally became a UNESCO Global Geopark and soon afterwards the Saltwells Local Nature Reserve was designated a geological National Nature Reserve. BCGS also acquired a Poet in Residence, Robert Francis. He was successful in securing funding for the project 'Chain Coral Chorus' and has provided live online performances. Some of his poems have been published in the newsletter, giving us a new creative dimension on the geoh heritage of the area. You can find out more here: <https://rmfrancis.weebly.com/chain-coral-chorus>

Membership levels have been generally stable and since the online talks programme began the Society has been happy to welcome several new members. In fact attendance at our online meetings has been a great way to be more inclusive, averaging higher numbers than usual. This is a wonderful and surprising result of the adaptations made this year.

From March 2020 the indoor meetings programme moved online using the 'Zoom' platform, including the AGM postponed from March to September 2020. The Chairman noted several of the talks held indoors or online, including 'Saltwells and Wren's Nest SSSIs' given by wardens Alan Preece and Ian Beech; and former local student Matt Sutton on 'Algae Fish and Climate Change: the last 3.5 million years'. The Chairman expressed appreciation to Keith Elder for the work he'd done to put on such a varied programme of indoor meetings, and to Ray Pratt for technical support with the online delivery.

Covid restrictions severely affected the field programme in 2020, though geoconservation days took place at Wren's Nest NNR, Saltwells LNR (now NNR) and Barrow Hill LNR before Lockdown1. The Chairman thanked and commiserated with Field and Geoconservation Secretary Andrew Harrison for the work achieved, and the later disruption. Chairman Graham Worton was able to create a virtual field trip to Saltwells used in the autumn at a GeoconservationUK meeting and again at the Geologists' Association 'Festival of Geology'.

The Chairman emphasised the increased importance of communication during lockdowns and thanked the 'Communications Team', John and Julie Schroder, Peter Purewal and Robyn Amos for their hard work on the website, newsletter, and general correspondence, with almost a 1000 followers now on the media channels. He praised the committee for providing a varied programme in spite of restrictions and challenges, and reported that plans are in progress for future talks and field excursions.

The Chairman noted that the work of the Black Country UNESCO Global Geopark had been stifled a little last year, and that the next steps will be to visit the Geosites, get the UNESCO badge shared, install new interpretation and develop new projects. ►

In summary the Chairman thanked the members and friends of the Society for all the practical help, suggestions, information, stories and ideas, and emphasized the value of suggestions and ideas that create new opportunities for the membership. ■

Graham Worton, Chairman (summarised by Julie Schroder)

Election of Officers:

Members of the Committee have offered themselves for re-election, and they have agreed to continue in their current roles:

Chairman: Graham Worton

Hon Secretary: position vacant

Hon Treasurer: Alan Clewlow

Vice Chairman and Field & Geoconservation Meetings Secretary: Andy Harrison

Meetings Secretary: Keith Elder

Newsletter Editor: Julie Schroder

Webmaster: John Schroder

Social Media: Peter Purewal, Robyn Amos

Other member: Bob Bucki

Davena Dyball is willing to audit the accounts for the next year.

GeoconservationUK (GCUK)

Conservation has been at the Society's heart since the third incarnation of BCGS was established in 1975. Behind the scenes the Society has been a member of GeoConservationUK (The Association of Geoconservation Groups) through the efforts of founding member Alan Cutler, who sadly passed away in 2020. It is the Society's intention to remain part of the group, which is important for promoting and gaining support with the conservation works we undertake in the Black Country.



GCUK held a delayed AGM on Saturday 27 March 2021. Lesley Dunlop was re-elected Chair and Dr Ian Stimpson as Honorary Secretary. Garry Dawson and Tom Hose were reappointed to the Executive Committee. Without Alan Cutler, the group is now minus a Treasurer and is looking for a volunteer to take up the role.

GCUK has some limited funds that it would like to use as matched funding to help kick-start geoconservation projects as we come out of Lockdown. Concern was expressed regarding the downgrading of the Geological Society of London's Geoconservation Committee to one that will only now meet on an ad hoc basis when major issues arise. It was noted that the IUCN (International Union for Conservation of Nature) has now published its 'Guidelines for geoconservation in protected and conserved areas' (<https://portals.iucn.org/library/node/49132>) and there is a proposal going to UNESCO for a 'Geodiversity Day' to be held on 6 October 2022 (www.geodiversityday.org). Groups could start thinking about what they might do for this. ■

Andy Harrison, (BCGS representative for GCUK)

Hello from another new BCGS member

In each BCGS Newsletter since October 2020 we have been pleased to welcome new BCGS members. The trend is continuing and in this issue we are delighted to introduce Mike Byrne, who has sent the profile below. From a wide diversity of backgrounds and interests, we look forward to meeting all our new members in the not too distant future for some face to face introductions and for you all to become involved in the 'real' activities of the Society. In the meantime, we'll look forward to welcoming more recruits (and profiles for the Newsletter) in the coming months. Ed.

Profile - Mike Byrne

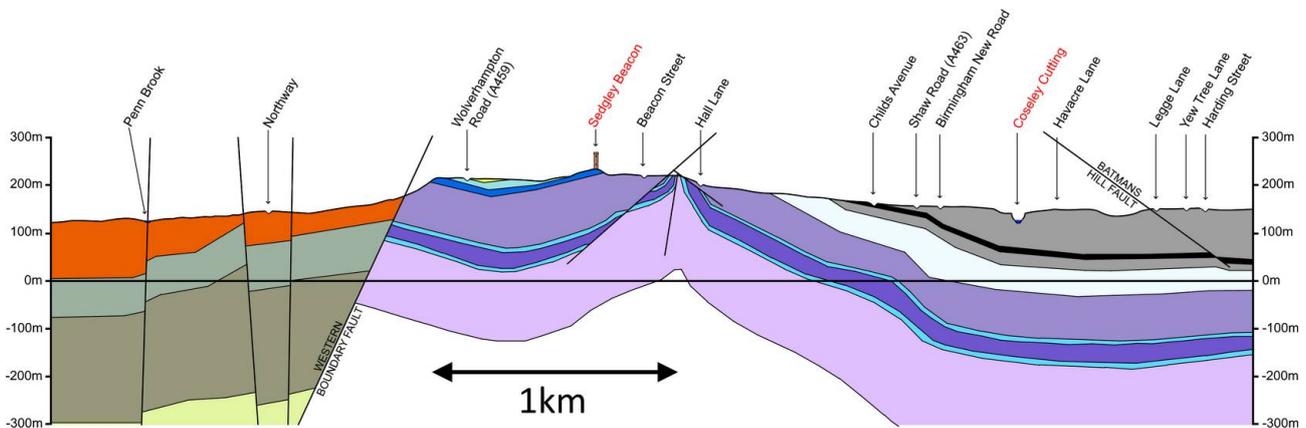
I have been interested in geology since 1976, when I went round Scotland for a week with a geography teacher who was looking for cheap rock samples. I did a geomorphology evening class a few years later. Then came children and more work responsibilities. My interest was rekindled by John Gerner from Bromsgrove U3A, and burned into me by a nearly four hour tour of the Dudley Museum given by Graham Worton. The photo is of me on a Bromsgrove U3A outing. I'm the Chairman, and I am also a local historian. ■

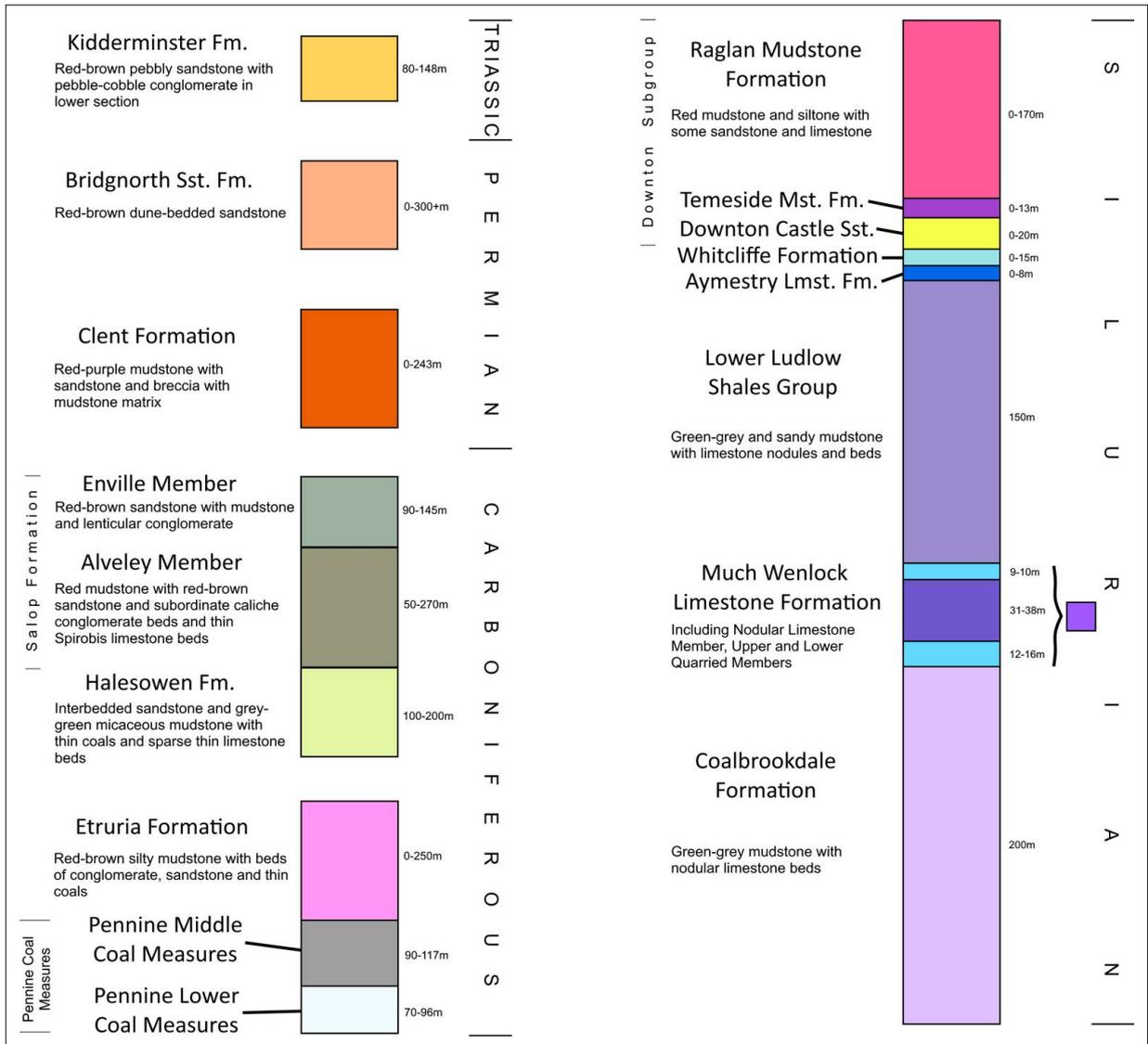
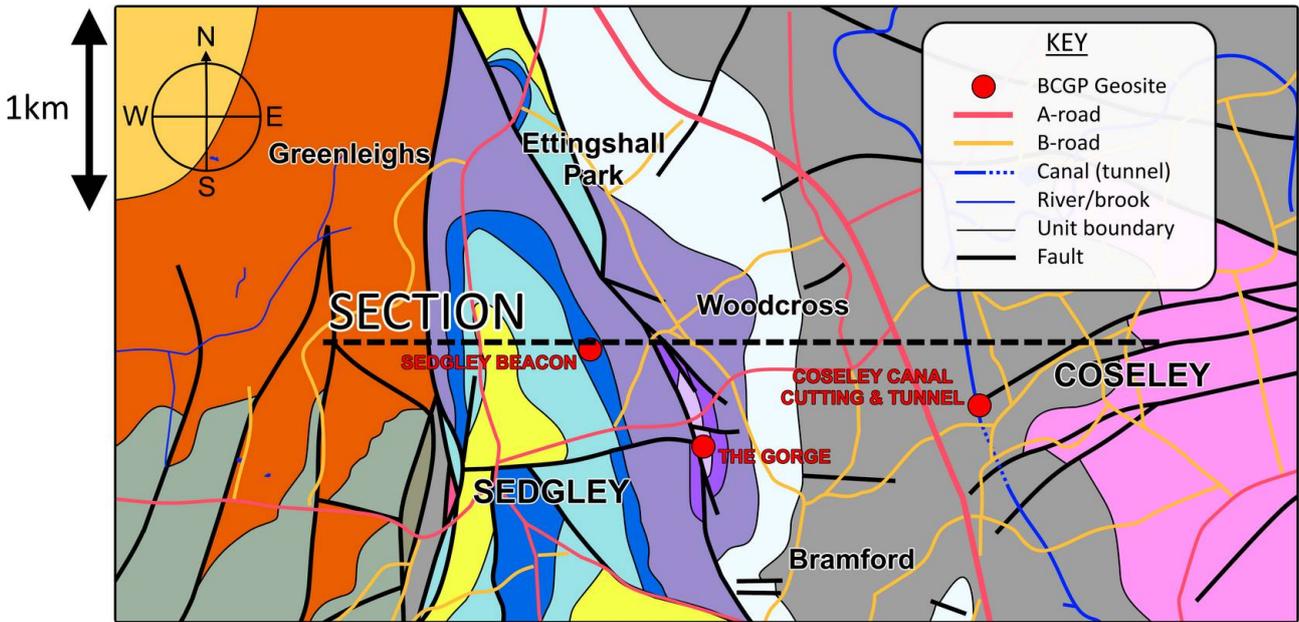


Mike Byrne

Matt's Maps No. 2 Sedgley Beacon & Coseley Cutting

The hill I've climbed more than any other is (rather uncreatively) called Pit Mounds. It's a steep, rounded 50m prominence at the northern end of Baggeridge Country Park that forms an admirable vantage point to appreciate the surrounding landscape. To the west you'll spy greenery, the rolling hills of Staffordshire and Shropshire all the way to the Clee Hills and, on a clear day, perhaps you'll even be able to spot a Welsh mountain or two. The scene to the east is starkly different but no less dramatic – a carpet of residential housing and industry that we call the Black Country. Whilst Pit Mounds is entirely man made – created from the spoil of the Black Country's last underground coal mine – a much taller and more natural hill dominates the view to the north-east. Beacon Hill, in Sedgley, is our region's highest point outside of the Rowley Hills. ▶





Beacon Hill

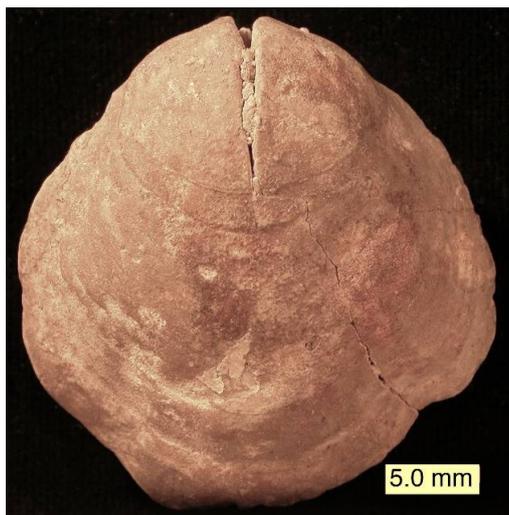
In common with Wren's Nest and Castle Hill in Dudley, Beacon Hill's topographic prominence is a result of the stubborn unwillingness of Silurian limestones to succumb to the erosive power of Black Country winters. Unlike those other peaks however, Beacon Hill is formed from the Aymestry Limestone. This band is several million years younger than the better-known Much Wenlock Formation which underlies Dudley's high points. For at least three centuries it has played second fiddle to its more fossiliferous neighbour. Historically, the Aymestry Limestone here was called the Sedgley Limestone or, more colloquially, 'brown lime' and was extensively quarried for use in construction, agriculture and industry.

The Aymestry is the youngest of the three major Silurian limestone bands found in the Black Country, formed 427 million years ago in shallow seawater on the fringes of the Avalonian continent during periods of low sea level. It reflects a marine habitat in which a rich diversity of creatures were able to thrive. Among the critters that have become fossilised here are brachiopods, bivalves, fishes, polychaete worms, ammonoids, sponges and at least one species of trilobite. Intriguingly, the Aymestry limestone also hosts an irregular fossil-rich 'bone bed' that reveals some of the most ancient evidence for ostracoderms (armoured jawless fishes) in England (Ball, 1951).



Headscales of *Paralogania ludlowiensis*, a thelodont fish found in the Sedgley limestone (modified from Märss & Miller, 2005)

You would be forgiven for overlooking the Aymestry - it is less extensive, less biodiverse and more poorly exposed than the Much Wenlock formation. In fact, even the legendary Victorian geologist Sir Roderick Impey Murchison misdiagnosed the age of the Sedgley Limestone in his first draft of 'The Silurian System'. Eventually, using the relatively new technique of biostratigraphy, he corrected his mistake by correlating the Sedgley exposure to those in the Welsh borderlands, recognising that both hosted the same species of fossilised brachiopods (Torrens, 1990).



Pentamerus brachiopod similar to the species Murchison used to recognise the contemporary relationship between distant exposures of Aymestry Limestone

Atop Beacon Hill's calcareous peak we find the iconic tower of Sedgley Beacon, the perennial subject of local folklore. It is said that the local Victorian astronomer, Lord Wrottesley, built the tower to improve his views of the heavens in the early 19th century. Sadly the truth is less romantic than fiction. It's now thought that the tower was built as a folly in 1846, although other towers had stood on this site for at least several centuries prior to this. Despite being a prominent enough landmark to feature on the coat of arms for Dudley MBC, the tower has been fenced off and in a state of disrepair for the entirety of my lifetime. Local groups have for many years unsuccessfully campaigned for funding to restore the tower so that its lofty views might once again be available to the public. Perhaps the Beacon's newfound status as a UNESCO Black Country Geosite might go some way towards empowering future bids. ▶

West of Sedgley and its Silurian bedrock we find the much flatter ground of Penn Common. The Common is underlain by lower Permian mudstones, sandstones and breccias and is much more prone to erosion than the nearby Silurian units. This lithological contrast is a consequence of the coalfield-defining Western Boundary Fault – a line of weakness in the Earth that demarcates the entire western edge of the Black Country. The importance of the Western Boundary Fault in the geological history of this area cannot be understated, and it is a feature that will be revisited many times in future sections.

One curiosity that is highlighted well by this section is the fact that the Aymestry Limestone (alongside the Whitcliffe Formation and Downton Castle Sandstone) outcrops only to the west of the anticline that dominates this area's structural geology. Why do we not find the Aymestry limestone in the east, similarly elevating land beneath Coseley and forcing the Birmingham New Road into a tunnel? The answer lies in the relationship between the Silurian and overlying Carboniferous units. The land east of Sedgley seems to have been lower-lying during Carboniferous times, when central Britain had turned into a tropical deltaic swampland. Rivers meandered across the landscape, and in lower lying areas eroded away the bedrock beneath them. In Coseley, the Aymestry has disappeared because it was overwritten by the rivers that flowed 110 million years later, just as those coal swamps began to form. You can directly witness the evidence for that event in places where the Silurian-Carboniferous contact is exposed above ground, such as Brewin's Bridge in Netherton. The divide is marked by a basal conglomerate that shows clear evidence of Carboniferous rivers churning up Silurian bedrock.

In the present day, these Carboniferous layers dip gently eastwards beneath Coseley. They provided ample opportunities for coal mining, the economic mainstay of this region throughout industrial times.

Coseley cutting

Dug into the coal measures is another Black Country Geosite: the Coseley Canal cutting and tunnel. Originally built to James Brindley's meandering design around 1770, the Birmingham-Wolverhampton Canal was modified and straightened by Thomas Telford 60 years later. Telford wanted to shun natural topography, building a canal that was as straight as possible and therefore permitting boats to move goods more quickly. He aspired to site his canal at the bottom of an immense ditch, which was to be dug right through the middle of Coseley. Thankfully, and perhaps following the protestations of Coseley residents, he was convinced instead to dig a 330m-long tunnel beneath the town. That tunnel remains open and navigable today, almost 200 years later. Deep trench excavations were still required either side of the tunnel, with the fortunate side effect (from a geologist's perspective) of exposing bedrock at the surface.

Despite its immense historical significance to the region, there are surprisingly few places where you can still see coal measure rocks exposed in the present day – mines have been backfilled or abandoned, and quarries have been smoothed over and covered by housing. The Coseley cutting provides one of the few remaining sites where you can actually see and touch layers from the coal measures. ►



The coat of arms of the Dudley Metropolitan Borough Council, featuring Sedgley Beacon at the crown

Most sections I've created for this series have been under 2km in length. This section, spanning 4km and around 150 million years of geological history, is an exception. I chose this scale to try and illustrate the large-scale structural and stratigraphic relationships between the major Palaeozoic rock types found across the Black Country. A future, much smaller-scale 'Matt's Maps' will focus on the other Geosite at Sedgley, 'The Gorge', which is narrowly avoided by this section line.

My thanks to Graham Worton for sharing his wisdom with me on the lithology and palaeontology of the Aymestry Limestone. ■

Matthew Sutton

References and further reading

The Sedgley Local History website is a fantastic resource that was invaluable in gathering historical information for this article: <http://www.sedgleylocalhistory.org.uk/>

Ball, H.W, 1951, The Silurian and Devonian rocks of Turner's Hill and Gornal, South Staffordshire. Proceedings of the Geologists' Association, 62(4), pp.225-IN1.

British Geological Survey, 2012, Geological Survey of England and Wales 1:50,000 series, Dudley.

Märss, T & Miller, C.G., 2004, Thelodonts and distribution of associated conodonts from the Llandovery-lowermost Lochkovian of the Welsh borderland. Palaeontology 47(5), pp.1211-1265.

Torrens, H.S., 1990, The scientific ancestry and historiography of The Silurian System. Journal of the Geological Society 147(4), pp.657-662.

My Involvement with Wren's Nest & Associated Locations

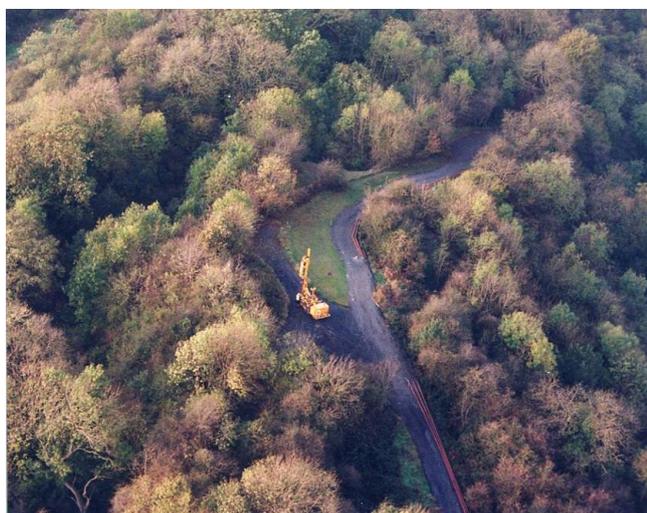
My name is Tony Mellor. I was raised and educated in Walsall and presently live in Perton, Staffordshire. In 1989 I graduated from the University of Portsmouth with a BEng (Hons) degree in Engineering Geology & Geotechnics, and then spent 10 years working as a geotechnical engineer for Wimpey Construction (based in Castle Bromwich, Birmingham). In 1999, I moved to Forkers Ltd where I have been employed for approximately 15 of the last 21 years. For most of that time I was the Site Manager on numerous mine stabilisation and engineering projects and latterly have been responsible for project design, and reporting for Forkers ground engineering department plus offering technical assistance to the Forkers Group as a whole.

I first became properly aware of the Wren's Nest in 1988 as a 20-year-old 2nd year undergraduate. As part of the degree, we were directed to select an area local to where we lived that would be suitable for geological mapping during the summer break. As we know, the Black Country and West Midlands areas are rich in geological importance but due to their industrial and residential nature this geology is largely inaccessible or covered over. The Wren's Nest and the surrounding area was the closest location that had both the quantity / quality of rock exposure needed for mapping and could also provide a follow-on engineering-based project. So, for ►



Mons Hill Site Compound on Priory Road (c.2001)

several weeks during the summer of 1988, I would regularly hop on public transport from my home in Bloxwich to Dudley and then to Priory Road and spend the days mapping the geological exposures at Wren's Nest, Mons Hill and the surrounding areas. Friday was 'treat day' when I would have a cob and a pint (or two) of Holdens in the Park Tavern, Woodsetton before returning home.

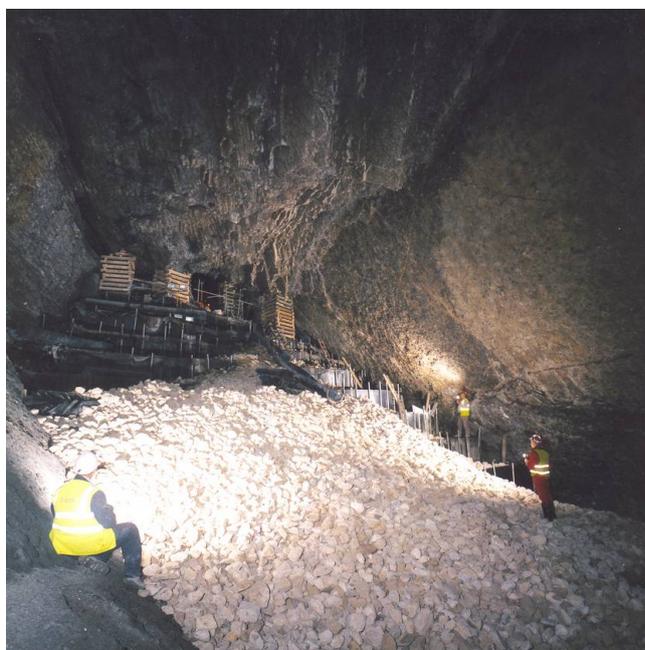


Drill rig working in the NNR at Mons Hill (c.2001)

Obviously, the rock exposures have not changed much but Wren's Nest and Mons Hill in 1988 were quite different compared with now. There were few in the way of the organised trails or the helpful educational notice boards and published information available today, although on the flip side it was possible to get direct access to many more of the actual rock faces to take the bedding and joint measurements that are needed for rock slope stability analysis.

Between 1983 and 1985 I had been employed by R. M. Douglas Construction Ltd as a technician in their materials testing laboratory, and during that time I had been involved in some of the initial trials undertaken to identify suitable pumpable

materials to infill the unstable limestone mines that were being recognised beneath Dudley and Walsall. Although, at the time, Wren's Nest was not due to be filled, it was therefore reasonable to base my student engineering project on stability analysis and a hypothetical stabilisation of part of the underground Wren's Nest caverns. So, numerous sets of bedding and joint data were plotted onto stereonet by hand during late 1988 and early 1989 to determine the potential rock failure mechanisms and show that the caverns could become unstable if they remained unfilled, and then describing how the underground galleries could be accessed by drilling boreholes from the surface and filled with cement-based grout. The report was duly presented for review in the spring term of 1989; at the time one of the university assessors suggested that the caverns at Wren's Nest were unlikely ever to be filled as the surface instability associated with their collapse would not affect any properties or infrastructure and therefore the necessary funding would not be made available (little did he know!).



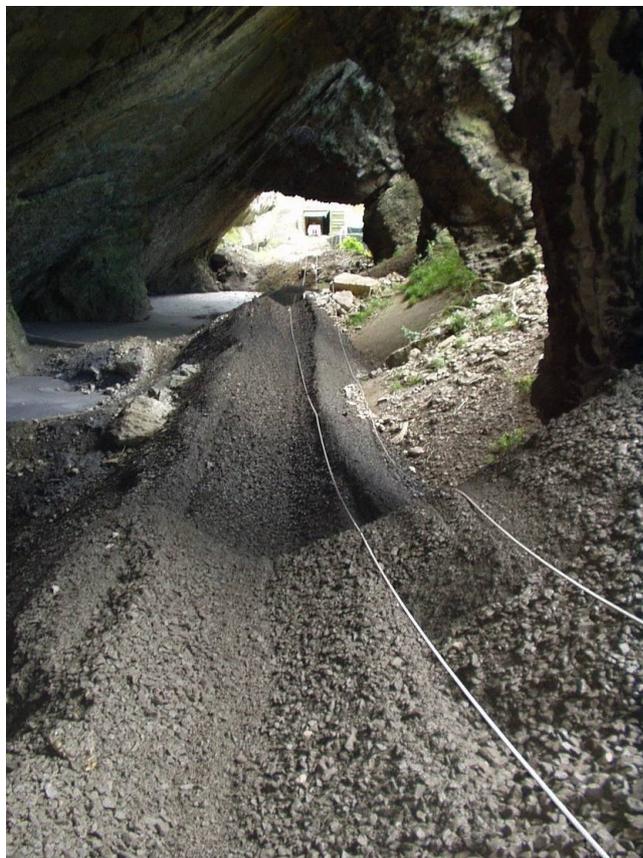
Northern Gallery (c.2004)

Jump forward nearly 12 years to March 2001 and therefore imagine my surprise to find myself head of the Forkers site team tasked with infilling and stabilising the underground galleries beneath Mons Hill at the northern end of the Wren's Nest limestone exposure for Dudley Council. Some people may remember the site compound that was set up on one of the football pitches on Priory Road, opposite the old King Arthur public house (now Aldi). Seven open and partially collapsed ►

galleries were duly filled with grout between March 2001 and February 2002. The deeper galleries were at depths up to 90m bgl and as access within the National Nature Reserve / SSSI was restricted to just a few temporary access trackways and isolated drill locations, most of the injection boreholes were offset and inclined to intercept the galleries at the required positions to allow grout injection.

Towards the end of 2001, an increase in underground roof collapses and mine cave-ins were reported at Wren's Nest. One such event was witnessed by a BBC News team filming at the Seven Sisters viewing gallery in late October 2001 and several emergency measures were subsequently instructed by the council to increase security and restrict unwanted access into the Wren's Nest caverns.

Forkers Ltd were not involved in the infilling of a number of underground Wren's Nest caverns that occurred in 2003/04 but were subcontracted to sink a new tunnel to give access for bats into the northern gallery close to Seven Sisters. The new adit was approximately 40m long and followed the 38-degree dip of the previously mined ground. We also filled the Upper Seven Sisters Gallery with loose stone using a conveyor system and drag bucket with the view that the stone would limit further deterioration of the existing supporting rock pillars but could be removed at a later date if the funds became available to stabilise them.



Seven Sisters - filling the upper gallery with stone

It is common knowledge that in 2007 a £50M bid was submitted by Dudley MBC for lottery funding to re-open the remaining caverns beneath Wren's Nest with a new entrance through Seven Sisters to connect them to a section of the underground canal system as a tourist attraction. Unfortunately, the Dudley scheme came second to the Sustrans cycling network, but in 2009 Dudley MBC secured funding to temporarily fill and stabilise the Step Shaft Mine Gallery which is also located at Wren's Nest. (See front cover photo: *Surveying the Cathedral Gallery at Step Shaft.*) This gallery was formed by mining the near vertical seam of Lower Wenlock Limestone more than 200 years ago. Although it has remained generally undisturbed since then, the condition of the 18m high gallery had deteriorated to such an extent that it had suffered a number of rock falls and was in a dangerous condition. I believe that Dudley Council are still hoping to secure funding to include the Seven Sisters and Step Shaft mines and linked underground canal system as part of a major heritage tourist attraction. The temporary infill materials would be removed as part of a full mine stabilisation and canal restoration scheme.

My professional involvement at Wren's Nest ends there but every so often I re-visit the site to walk the routes that my foreman (Michael Forker Snr) and I did daily in 2001/02, but mainly in the vain hope of finding the perfect Dudley Bug fossil. ■

Tony Mellor

Photos with kind permission from Forkers Ltd.

BCGS Poet in Residence

R.M.Francis

In April I'm running a fossil themed poetry workshop for the Lapworth (*details and link on p.4*). I'll also (hopefully) be doing some actual Geopoetry walks in Wolverhampton as a legacy event for the Wolverhampton Literature Festival, but still waiting for dates and times to be confirmed. This will be a walk through a few of the geosites, exploring some of the treasures and stopping for mini writing sessions. In May I'm giving a talk for the University of Wolverhampton in Telford about Lockdown, Walking in the Geopark and Geopoetics, and I'll share the link once its live.

I've mentioned before that I'm linking up with a number of local and national poets to help spread the word and add to the project; Liz Berry, Roy McFarlane and Emma Purshouse will be sharing their poems and blog posts soon, and I'm still in the process of organising a big climax event in June with Tim Cresswell and Norman Bissell. ■

R.M. Francis

Here is the second of two poems by R.M. Francis inspired by Matt Sutton's talk for BCGS last December, Ed.

Coccolithophore

In chain coral codas, she crystalised
convex plates with polysaccharides.
Her fearless radial symmetries
burn bright in sheer geometries:
raise white cliffs in pelagite spew;
colours the reef and mesh of foods;
cleans solutes with light. Gasses the wreck
in choral Ashet arabesques.

Father / Daughter bring tip to tongue
from another humanless and long
fieldwork drift to Shire Oak barr
tasting salt-driven wyvern's scar.

Call her Emiliani, Huxley, Coccolithophore.
Nothing so huge has ever been so small.

Mike's Musings No. 32 - 'Mud, Mud, glorious Mud'

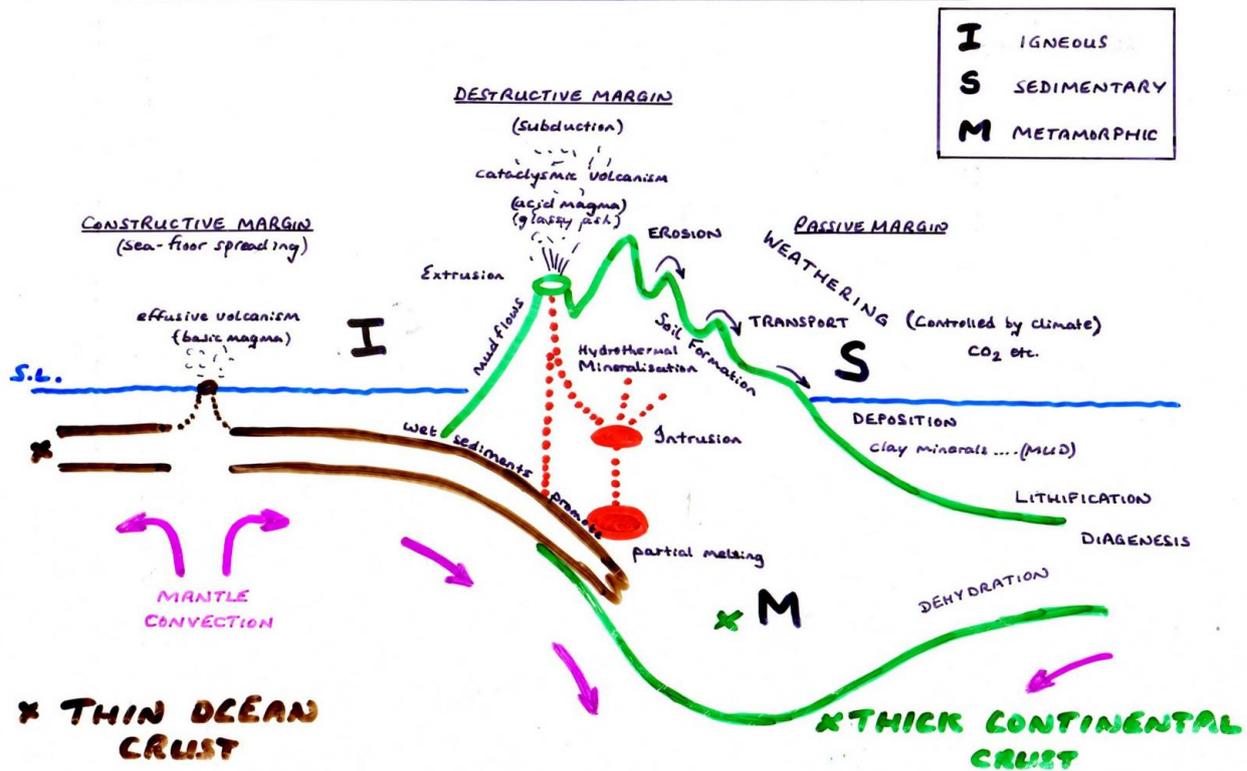
During the months of curtailed freedom throughout the Covid crisis, I have wandered a good many miles along Midland footpaths for the purpose of both exercise and 'idle' exploration. This has contrasted with much of my previous perambulation in more distant and hillier country, and has opened my eyes more widely to the characteristics of the more highly cultivated, lowland terrain; 'within the intake wall' so to speak. Not least is the greater attention needed to navigate, when walls, fences and other obstructions dictate one's 'freedom to roam'.

Another of the characteristics I have thus encountered is the far greater proximity, it seems, to mud! Every field corner, especially where passage into the next field is required, seems to be obligingly churned up by the passage of tractor, plough, boot, and in particular, hoof of the local inhabitants!



But mud, along with sweaty boots, socks and feet, is nothing to be sniffed at. Mud is something we perhaps all take far too much for granted. Mud has been a part of the *landscape*, I suppose, for a very long time. You have to go well back into 'deep time' to imagine a world without it. Of course, it has been a part of the *marine* realm for a great deal longer. ►

THE ROCK or MAGMA - TO - MUD CYCLE



Mud has been part of the so-called 'magma-to-mud cycle' (geologists do like their 'cycles' don't they? - but that's for another day), for at least 3,700 million years according to most relevant sources. Ever since volcanoes have been producing magma, the mechanism by which landmasses were first brought into being amidst an Earth covered by water, mud has been one of the main degradation products of weathering processes breaking down those primary, and primeval, igneous rocks. For an excellent account of this magma-to-mud cycle I would recommend Dick Merriman's feature article in the popular magazine 'Geology Today' (volume 18 number 2, March/April 2002).

Most igneous rocks comprise of just a handful of minerals: to be more precise, the 'rock forming' silicate minerals (which you may recall from Musings 20 and 21, Newsletters 254/5, April/June, 2019). With the exception of quartz alone, these minerals contain a host of chemical constituents that decompose largely into a very important group of secondary silicates collectively referred to as the 'clay minerals'. Now you can see where this is heading! The quartz ends up as the quintillions of sand grains on all the beaches that ever were. But the clay minerals end up as the mud beneath your boot everywhere else! To briefly, and not very scientifically, complete the cycle; mud, sand and everything else in fact, eventually ends up being carried down into the depths of the Earth's crust, where it ultimately melts and gets recycled in the next generation of volcanic extrusion, or, alternatively, plutonic intrusion, producing new rocks ripe for weathering.

But, to return to the main theme, we are left to further consider the clay minerals. They are of such huge importance to many of the processes on Earth that they have a whole volume to themselves in Deer, Howie and Zussman's celebrated series of scholarly mineralogical textbooks. They are all part of the 'layered-' or 'sheet-' (*phyllo*-)silicate clan, along with the more familiar micas, and are all basically hydrated alumino-silicates, with or without further chemical elaboration. ►

They also all share the important property of being chemically reactive, having the ability to absorb and release fluids (especially water) as well as other chemical constituents as ionised particles, by 'ion-exchange' processes. This quality is important in their formation too - principally by the physical and chemical breakdown of other rock-forming minerals (notably feldspars and micas) but also from volcanic glass which forms in vast quantities during certain kinds of eruption.

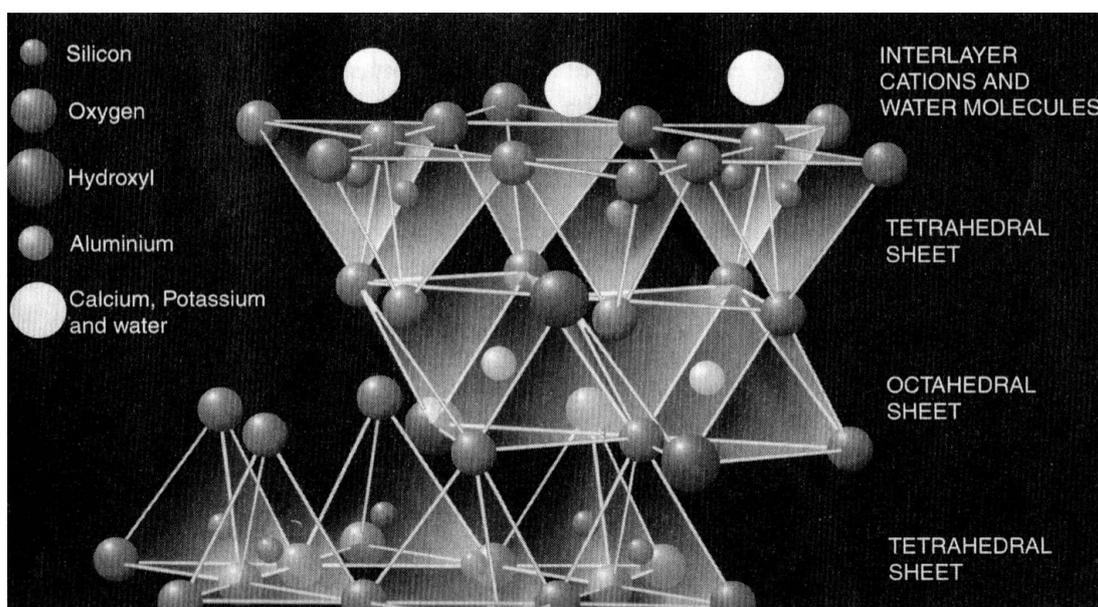
Fortunately, for simplicity, it is possible to distil clay minerals down into two principal groups based on their atomic structure, which is either composed of two- or three- layers. Without delving too deeply into the intricacies, we can further recognise four main types on chemical grounds:

Two-layered (dimorphic):

Kaolinites basic 'hydrated alumino-silicate' derived from acid igneous rocks

Three-layered (trimorphic):

Illites 'potassium clays' derived from feldspars and 'light micas'
 Smectites 'calcium / sodium clays' derived from basic igneous rocks and 'glass'
 Vermiculites 'magnesium clays' derived from 'dark micas', chlorite, hornblende



A trimorphic clay structure

This list includes names both familiar and unfamiliar. Kaolinites will jump out from the names as it includes the material kaolin that so transformed the higher end of the ceramic industry after it was discovered in the Tregonning Hill granite in Cornwall by William Cookworthy in 1746.

Vermiculite may also be familiar thanks to its unusual expansion properties when heated (the name derives from the Latin *vermiculare*, 'to breed worms!'), making it an ideal component in insulation products. It is also widely used by horticulturists and gardeners for soil improvement.

Illites and smectites are perhaps less familiar names. The former are very similar to the micas, whilst the latter includes clays present in 'Fuller's Earth'. Another smectite is montmorillonite which is a major constituent of 'bentonite', widely used in the drilling industry, and also familiar in the Black Country (and elsewhere) as dateable ash bands within the Silurian stratigraphy. ►

Clay minerals and their derivative products turn up in countless everyday commodities, which could form a separate article in itself.

Furthermore, but to keep things very simple, dimorphic clays generally don't hold water, or very little, whilst trimorphic clays hold water more readily and to a greater extent. This lies at the heart of what I have discovered on my previously mentioned countryside rambles. Cross some muddy fields and your boots remain reasonably clear of cloying mud. Cross other fields and you can end up doubling your weight with the mass of the stuff clinging to your feet. In this context the use of the word 'mud' morphs into the concept of soil, where there are other important constituents, not least the organic materials that add much to a soil's fertility. Gardeners will be quite aware of the difference between light sandy soils, middling loamy soils and heavy clay-rich soils, but it is only thanks to the weathering of rocks that there are soils of any kind at all. Planet Earth was a very different place indeed before landmasses became widely established as places for soils to develop, ably assisted by microbes and fungi, ultimately to the benefit of the evolutionary proliferation of the 'higher' plant and animal kingdoms. One might even argue that without soils (largely mud), the evolutionary path to ourselves might never have arisen. Mud has been described as the Earth's life-support system - which is quite a thought to reflect upon.



Mam Tor landslide

Mud can, on occasions, be a great nuisance to mankind, quite apart from the labour involved in cleaning it off everything it comes into contact with! To civil engineers it can pose nightmare problems when encountered in foundations for major construction works. Clay beds often lie behind the development of landslides because they are fundamentally so weak, compounded by their water retention properties which act as destabilising lubricants. Some classic examples have dogged the integrity of the Panama Canal (details for which I'm indebted to another article in a more recent edition



Hippopotamus, Kenya 2017, Wikimedia Commons

of 'Geology Today' by Tony Waltham - volume 36 number 6, November/December 2020). But you don't have to travel that far to witness such effects: far closer to hand is the famous state of affairs at Mam Tor, just above Castleton in the Peak District, which affords the opportunity for a very close inspection through the anatomy of a landslide, as well as a chance to get 'muddied up'!

In conclusion then, 'mud' is something we, like hippopotami, should learn to love, enjoy, but above all, respect, far more than we do. ■

Mike Allen