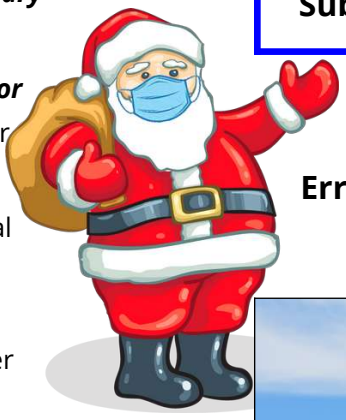
Newsletter No. 270
December 2021

Contents:



Erratic? Yes, but not in Birmingham! Read on...

Copy date for the next Newsletter is Tuesday 1 February

Position vacant **Honorary Secretary,** secretary@bcgs.info	**Andy Harrison,** **Field Secretary,** ☎ 07973 330706 fieldsecretary@bcgs.info	**Julie Schroder,** **Newsletter Editor,** 42 Billesley Lane, Moseley, Birmingham, B13 9QS. ☎ 0121 449 2407 newsletter@bcgs.info

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.

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 programme of online 'Zoom' meetings.

Visitors are welcome to attend BCGS events.

Monday 13 December *(Indoor Meeting at the Archives):* 'Deciphering the Fossil Record'. Speaker: Dr. Dan Cashmore. A Christmas Special combining a talk plus a Christmas Buffet at the Dudley Archives.

Monday 17 January 2022 *(Indoor Meeting):* 'West Midlands National Park'. Speaker: Kathryn Moore, Professor of Landscape architecture, Birmingham City University, and Director of the WMNP project. 'The Project seeks to establish a new kind of National Park for the West Midlands. This immense rolling landscape, the crucible of the industrial revolution, the nexus of the UK's major agricultural regions, with its complex infrastructure of canals, highways and byways married to some of the most beautiful, forgotten areas in Britain awaits a re-imagining for millions of people with the creation of a West Midland National Park'.

Saturday 5 February *(Geoconservation Day):* Wren's Nest. Directed by the reserve wardens. Meet at 10.30 at the Warden's office, at the end of Fossil View (the road into the new housing estate, site of the former Mons Hill College). Parking along Fossil View. The day will involve scrub clearance. Bring gloves, stout footwear and packed lunch. Wardens will provide tools, hard hats if necessary and a hot drink. Finish around 2.30.

Monday 21 February *(Zoom Meeting):* 'The Rocks That Don't Belong'. Speaker: Dr. Martha Johnson, University of Highlands and Islands, Orkney. This talk will explore the geological basis for understanding the rock at the Ness of Brodgar, Orkney. All stone is rock but most rock is not stone. In the index or glossary of most geology texts there is no listing for stone. Conversely, in most archaeology texts, there is no listing for rock. 'The Rocks That Don't Belong' research project is investigating the non-structural, non-tool rocks recovered from the Late Neolithic site, the Ness of Brodgar, Orkney.

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.

Geological Society, West Midlands Regional Group

Tuesday 14 December: 'Hinkley Point C: Slope Loading Check'. Speaker: Hamish Strachan (Atkins). **'Variable Glacial Ground and Liquefiable Soil Conditions'.** Speaker: Ryan Beech (Jacobs).

Tuesday 11 January 2022: 'Subsurface engineering and water resources of Greater London'. Dr Jonathan D. Paul Royal Holloway, University of London.

Tuesday 8 February: 'A new understanding of Pleistocene glacial events as revealed from mega merge seismic data of the North Sea'. Prof Mads Huuse, The University of Manchester.

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.

Teme Valley Geological Society

Monday 24 January 2022: 'Stromatolites: Making Mountains out of Microbes'. Speaker: Prof Ian Fairchild, Birmingham University.

Monday 28 February: 'Tectonics and magmatic structures in the West Midlands'. Speaker: Dr Carl Stevenson, Birmingham University.

Talks will be held at 7.30 in the Martley Memorial Hall, on the B4197 by the Sports Ground, Martley and will be relayed by Zoom. For field trip details and further information contact John Nicklin on 01886 888318 or visit: http://geo-village.eu/ Non-members £3.

Shropshire Geological Society

Wednesday 12 January 2022: 'Not written in Stone - Plate Tectonics - over 50'. Guest speaker: Keith James.

Wednesday 9 February: 'Darwin and the Geology of the Galapagos'. Guest speaker: David Norman, Cambridge University.

Lectures are being held using Zoom and commence at 7.15 for 7.30. Further info: http://www.shropshiregeology.org.uk/SGS/SGSEvents.htm

Woolhope Naturalists' Field Club - Geology Section

Saturday 29 January 2022: 'Natural Foundations – the role of geology in nature conservation'. Speaker: Dr Colin Prosser.

All meetings will be held on Saturdays at 2.15 in the Town Hall Assembly Room, Hereford unless otherwise notified. Non members are welcome. Non-members of the Club pay £2. Visit: https://www.woolhopeclub.org.uk/meetings or contact Sue Olver on 01432 761693, email: susanolver@hotmail.com

Warwickshire Geological Conservation Group

Wednesday 15 December: 'A very British summer in the late Triassic: torrential rain, the Arden Sandstone and the dawn of the dinosaurs.' Speaker: Emeritus Professor Stuart Burley, Keele University. 'Hybrid' evening Lecture in Kenilworth and online via Zoom. To participate via Zoom please register in advance for this meeting: click to register.

Wednesday 12 January 2022: 'LLPS: The secret life of the starfish/crinoid'. LLPS Zoom Lecture by Dr Aaron Hunter.

Wednesday 19 January: 'Mining on the Iberian Peninsula'. Speaker: Rob Vernon. Hybrid meeting held at Kenilworth Methodist Church & Via Zoom.

Venue for talks: Kenilworth Methodist Church. There is a charge of £2.00 for non-members. For more details visit: http://www.wgcg.co.uk/ or email: WarwickshireGCG@gmail.com. Meetings start at 7.30 with tea/coffee and biscuits available beforehand from 7.00.

East Midlands Geological Society

Saturday 8 January 2022: 'The value chain of minerals for the green transition: Reflections on raw materials demand and supply'. Speaker: Dr Karen Hanghoj.

Saturday 12 February: 'Yorkshire's (...and the East Midlands'...) Ancient Storms'. Speaker: Andy Howard.

Meetings will be held in the Geography Department of Nottingham University at 6.00. Non-members are welcome and should register with the secretary. Further info: www.emgs.org.uk or email: secretary@emgs.org.uk

Check websites for the following societies:

Mid Wales Geology Club: https://www.midwalesgeology.org.uk/
North Staffordshire Group of the Geologists' Association: https://nsgga.org/
Lapworth Lectures: https://www.birmingham.ac.uk/facilities/lapworth-museum/events/lectures.aspx
Herefordshire & Worcestershire Earth Heritage Trust: https://www.earthheritagetrust.org/

Editorial

Once again, we're not short of material to inform and entertain you in the pages of our Newsletter, and I'd like to thank our regular and occasional contributors for all their efforts.

The first item on our programme of events is a cause for celebration. This will be our first meeting at the Museum and Archives since the start of the Pandemic. We have Dan's talk to look forward to and a chance to pick up some of our local site leaflets and trails, plus our Christmas buffet and the pleasure of being able to enjoy each other's company once again.

In this issue there is an up-date on the two Birmingham projects, with a strong invitation for you to get involved with the Erratics project, and this subject gets aired in its broader context with Mike's whistle-stop tour covering some fine examples of glacial erratics, mostly from the Devensian Ice Advance, lying north of the Midlands.

We have another fascinating instalment of Matt's Maps, in this case opening our eyes to one of the Geosites which is perhaps less well known, and on a more philosophical note, our poet in residence, Rob Francis inspires us to think of the connectedness of our geological, industrial and social heritage through his project, 'Chain Coral Chorus'.

For those who have missed some of our on-line talks, most of them are on our YouTube channel here. There's nothing much to commend Covid 19, but it has at least brought us the benefit of on-line talks, and the possibility of hearing them after the event. Special mention should be made of Graham's talk on the progress of the Geopark through its first year – an eye opener into the vast amount of hard work going on behind the scenes: https://www.youtube.com/watch?v=2RrD2cJSI8k&t=2914s

Finally, following Alan Clewlow's report about the Icelandic Fagradalsfall volcano in the last issue, I'd like to draw your attention to an excellent report, translated from German, with stunning photos here: mindat link. ■

Julie Schroder

Birmingham's Building Stones and Boulders

Two project up-dates

The Building Stones of Birmingham

In the last issue Andy reported on the leaflet launch event in August. This marked the end of the project to produce the leaflets, but just the beginning of their future life! The aim now is to get them out to as many people as possible to encourage self-guided walking and more guided walks - not just led by BCGS, but hopefully other local groups will get involved as well. We got off to a good start guiding a group on Trail 2 for Birmingham Heritage Week, and in October we hosted a visit from WGCG for a walk on Trail 1.

We've taken batches of the leaflets to as many outlets as we can think of, and through contacts have had requests from various local group leaders for copies of the leaflets. By far the best outlet has been the Library of Birmingham. They have distributed nearly 300 of each leaflet! Copies will be available at our Christmas meeting on 13 December, so please help yourselves, and spread them around. ►

There are still a few loose ends to complete the project, mainly with regard to the website. The face of Birmingham has changed dramatically since the original trails were completed by Ruth Siddall in 2017. These changes are reflected in the leaflets, and the aim is to bring the web-based versions in line, and then keep them up-dated as things continue to change. So far, the web version of Trail 1 is done (for the moment!) with some extra photos, but trails 2 and 3 still need some work.

If you haven't yet enjoyed a guided or self-guided walk around Birmingham, pick up the leaflets and enjoy! But beware! At the moment central Birmingham is buried under the Christmas fun-fair and market, and heaving with people more endowed with the Christmas spirit than Covid awareness. It may be best to wait until the New Year when the trappings of Christmas have gone and the stones are revealed in all their glory again. *(Leaflets are also available from me! Ed.)*

Birmingham's Erratic Boulders: Heritage of the Ice Age

In the last issue I introduced the erratics project manager, Val Turner, and volunteer co-ordinator, Dan Cashmore. The project was officially launched at the end of October with presentations at the Lapworth Museum, and the volunteer recruitment process was set in motion. Since then there has been a concerted effort from the team to get the administrative framework in place, making numerous connections with local groups and officials. There have been several site visits and a major clearance session at the Frankley Hill boulders, undertaken by the Friends of Balaam's Wood and other volunteers, including our regular columnist, Mike Allen. Mike goes to town on the subject of 'Erratics' in his Musing for this issue – though his emphasis is on Devensian specimens, rather than the much older (probably Anglian) boulders in the area covered by this project.

Refreshments courtesy of the Friends of Balaam's Wood, in the railway cutting below the Frankley boulders

Erratic scheduled for re-location in Woodgate Valley Country Park. Ian Fairchild tries to educate a curious horse about its significance!

Through the site visits, there is a gathering momentum of support from local people, and trail testing the initially proposed routes is already leading to improvements and discoveries.

Dan has now produced a handbook and other information for potential volunteers, and will be launching a recruitment campaign in the New Year. Why not get ahead and contact Dan for more information now? Here's his address: d.cashmore@worc.ac.uk

Volunteering is fun! In the handbook Dan outlines many ways in which you can get involved. ■

Julie Schroder (BCGS rep on the Erratics Project steering group)

Hebridean Gems Part 1: The Island of Coll

Though Mike intended to present his discussion of Coll and Tiree as a joint item, space dictates that we should separate them. In this issue we will learn of his visit to the Island of Coll, and will look forward to Tiree next time… Ed.

A Sandy Beach on Coll: Traigh Gharbh

The islands of Scotland have long been a favourite destination of mine and my 'bucket list' extends no further than to visit as many of them as possible. The two I visited most recently (Coll and Tiree) in the summer before Lockdown, especially delighted me as they didn't require too much effort to get around, particularly in the vertical dimension (!), but had so much to offer. They really should be done as a pair to fully appreciate the complete contrast 'in feel' between them. It also makes practical sense to combine a visit as they are both served by the same round trip ferry service from Oban, which can be broken up to allow as much time as you want on each island.

The dual carriageway on Coll!

Geographically they are separated by just three kilometres of Atlantic Ocean (mostly occupied by the small intervening islet of Gunna, with two narrow sounds on either side). Geologically they are both largely composed of Lewisian gneiss, such that they have more in common with the Outer Hebrides than the Inner Hebrides to which they are usually assigned - although I suspect that most Scottish islanders imagine themselves as being distinct from all others, impressing their individual qualities on all who visit.

I shall begin with a consideration of Coll for no better reason than it takes alphabetical precedence. As the ferry approaches, having emerged from the Sound of Mull into a more open ocean highway, it is Coll that catches the eye first. You land at the pier at Arinagour, the only village on the island. To your right, a more or less continuous low wall of cliffs extends to the north-eastern tip of the island, while beyond to your left, the coast is more varied, with several sandy bays interrupting the more indented coastline. Once ashore and through the village you have the grand choice of two roads. One divides further on and serves much of the northern coast. The other heads towards the western end of the island, but falls some four kilometres short of Calgary Point at the western tip. It also fails by two kilometres to link up with one end of the northern road. This apparent failure of the road network to serve the whole island is actually a blessing as it does force one out of the car to explore some delightful stretches of dunes on foot. Two features of the road network made me smile: the occurrence of a short stretch of dual carriageway on the northern road to Sorisdale, and the 70 mph speed limit sign on a side track down to Hyne. The island also boasts a football ground: home to Coll United (or did I imagine this – who are the opposition?). ►

Watch your speed!
The track to Hyne

Cnoc-an-Lochan scenery, and a contrast between grassy mounds and bare crags

The north-western part of the island is clearly the most rugged, with an abundance of lumpy crags of gneiss and intervening swampy ice-scoured hollows, referred to as a 'cnoc-an-lochan' landscape, which can be difficult terrain to navigate (not that I tried very hard to do so). The rest of the island looks more yielding, but this is deceptive in places where the rough and tough cover of vegetation often conceals an ankle-wrenching rocky substrate. The best walking is either along recognisable tracks or across flatter areas of dune and machair. Ben Hogh, at a mere 104m, is the only notable high spot on the island, although Ben Feall (66m), further south-west, also offers some scrambling.

Orthogneiss: a crag near the dual carriageway

Turning to the geology, Coll (and Tiree) owe their very existence to lying on the upthrow side of a major 'Camasunary - Skerryvore' fault, which takes the form of a half-graben structure extending north-eastward beyond Camasunary Bay on Skye and south-westward beyond the Skerryvore lighthouse to who knows where! It runs parallel to the more famous Great Glen Fault, and is possibly of the same age (i.e. initiated during the early stages of the Caledonian orogeny – ? late Silurian) but with later movements including those associated with the opening of the Atlantic. This has preserved a block of ancient Lewisian rocks closer to the mainland than the Outer Hebridean terrane, and on Coll, Lewisian basement is about all you get, separated into an eastern area of orthogneisses (derived from igneous parents), and a western area that includes paragneisses (derived from volcanic and sedimentary parents), that have been sculpted into a more varied landscape.

Summit Crags on Ben Feall: note the strongly developed, steeply dipping ?cleavage in these psammites

At least six phases of deformation have been recognised in these rocks, in places producing ptygmatically folded migmatites with varied textures characteristic of partial melting separating an acid-rich 'leucosome' from a basic-rich residuum. Amongst the paragneisses, small, isolated lenses of pinkish 'Coll Marble' have been described from localities along the south-west coast. The highly quartzitic gneisses (metaquartzites and psammites: originally sandstones?) of Ben Feall appear less highly deformed and show a distinct and uniform, steeply dipping, fabric not so evident elsewhere on the island. ►

One of the more recognisable elements of the geology are the three separate sets of doleritic dyke swarms intruded into the gneisses. Representatives of the 2.4 billion year old 'Scourie dykes' are typically deformed with the formation of new minerals such as garnet and epidote, especially amongst some highly sheared rocks restricted to the northernmost part of the island. The much younger Permo-Carboniferous dyke swarm includes some rocks of unusual composition known as lamprophyres (specifically camptonites). The youngest, undeformed, Palaeogene dykes are easiest to pick out, and are believed to be associated with an igneous centre on Mull. In addition, small intrusive masses of pegmatite can also be found, notably near the RSPB beach car park near Feall.

A ? Permo-Carboniferous Dyke: Traigh Gharbh

Sandrock near Hogh Bay.....
just a few thousand years old?

Little is known of the post-Lewisian geological history of the island apart from what can be inferred from the broader geological story of Scotland. Pebbles of Torridonian nature (later Pre-Cambrian) are present on the beach at Hogh Bay (and perhaps other north coast beaches), and probably derive from undersea outcrops or from Rùm further north.

Features associated with the twenty or so large (and a dozen or so small) sandy beaches that fringe the island are of much interest. In places some of the tallest dunes in Scotland have developed, largely composed of windblown shell sand, which has also helped to produce fertile stretches of machair on an otherwise fairly poor soil cover. Peat is limited to small patches, locally accumulated in ice-scoured hollows. In some areas the calcareous nature of the shell sand has allowed recent (i.e. Quaternary) re-deposition of a lime cement producing a 'calcrete' described as an 'indurated aeolian calcarenite' or more simply as 'sandrock', complete with cross-bedding structures. In Hogh Bay this can be seen resting directly on Lewisian gneiss, representing one of the largest age-differentials across any unconformity on Earth!

Unconformity in Hogh Bay. Sandrock
(NOT loose sand) over Lewisian Gneiss

The 'Ice Age' has, of course, left its mark on Coll. Some of the beaches were 'raised' after the last ice sheets disappeared, carrying with them erratic blocks exemplified by a huge pegmatitic boulder beside the track to Ben Feall (mentioned by Boswell in his account of Dr Johnson's Highland tour) and the celebrated 'Rocking Stone', a perched erratic near the summit of Ben Hogh, being a 20-tonne block of local (?) gneiss supported on three tiny pedestals. ►

The summit of Ben Hogh and the perched erratic (see also front cover photo)

There are many other reasons for visiting the island; clan history (Breachacha castle, as forbidding as any edifice I've come across, and being slowly renovated); well preserved black houses (at Totamore); WW2 history (relics of the Atlantic convoys), and even fine dining (Arinagour may be small, but isn't limited to porridge and haggis!). All these make for an interesting and varied experience. ■

Mike Allen

Dorset Group of the Geologists Association

Visit to the Black Country Geopark

Saturday 4 to Sunday 5 September

This visit from the Dorset group of the GA was a 2nd reciprocal visit, arranged following the BCGS visit to Dorset in 2019. The trip was led by Graham accompanied by Andy Harrison, and the following is Andy's report of the trip which we thought you might like to see, as it covers some key sites in the Geopark. Ed.

This weekend visit marked a return to the Black Country for the Dorset Group of the Geologists Association (DGAG). It was postponed from September 2020 due to the pandemic. Their last visit was in the spring of 2018 when they had a guided tour of Wren's Nest. Their two-day itinerary, this time, aimed to provide a comprehensive insight into the Black Country Global Geopark and complemented the previous visit. The visit explored the Silurian, Carboniferous and Permo-Triassic geology, industrial heritage, museums, canals and local industries that the Black Country has to offer.

Day One, Saturday 4 September. The group was led by Graham Worton who they met at the Geopark headquarters, Dudley Museum and Archives (Geosite 1) at 9.30. After an introduction to Black Country geology and the Geopark, the group made their way to Castle Hill (Geosite 17) with a walk exploring the caverns and Silurian strata that form the hill and hint at its mining legacy. The walk was followed with a boat trip along the Dudley Canal Tunnel and into Singing Cavern (Geosite 10) taking a closer look at the Silurian geology and mining heritage.

Lunch was in the Gongoozler Restaurant at the Dudley Canal and Tunnel Trust visitor centre before the afternoon visits. A short drive brought them to the first stop of the afternoon at the Rowley Hills Viewpoint on Darby's Hill Road, Tividale (Geosite 39). Here the group was introduced to the Black Country's Carboniferous geology and the various dolerite bodies that have intruded the Coal Measures and significantly shaped the landscape. At their next stop, Blue Rock Quarry (Geosite 23), the group got a closer look at the exposed dolerite and various associated features such as its columnar jointing and concentric weathering, the quarry reflecting the industrial heritage of dolerite extraction that went on in these parts. ►

DGAG Visit Cobbs Engine House

For their last location of the afternoon the group dropped down off the Rowley Hills to the Bumble Hole and Warrens Hall Local Nature Reserves (Geosite 12). With great views over the Geopark, Graham explained how the region had become important for mineral extraction and industrial evolution; how man's activities had shaped the landscape in response to the underlying geology and left the legacy of green space and industrial relics seen dotted about today.

Day Two, Sunday 5 September. The Group was led by Andy Harrison who they met at Barrow Hill (the Dudley Volcano), Local Nature Reserve (Geosite 5). We started our day on the highest point picking up from the day before and looking at the regional landscape and how it had been shaped by geology and human hands. Heading into East Quarry, the group was able to see more features within the dolerite and its relationship with the Etruria Marl Country Rock. Back at the cars, examples of all the strata to be found within the Black Country were handed round for examination before we headed off to the next location.

Our second stop for the morning was at the Red House Glass Cone (Geosite 19) near Stourbridge where the group was introduced to the area's glass industry, and had a walk along the Stourbridge Canal. The canal provides an ideal opportunity to discuss canal building and how the local landscape affects its course. The group also got to see how the canal network was important for moving industrial goods out of the Black Country and all over the world.

DGAG Visit Saltwells

We had lunch in the café at the Red House Glass Cone and afterwards drove to the Saltwells National Nature Reserve (Geosite 4). Here, we followed the route along the tubline to Doulton's Claypit and the tubline cutting before crossing Highbridge Road and finishing up at Brewin's Cutting. Along the route the group were shown how human hands have shaped the local landscape taking advantage of natural features such as the Blackbrook Valley, and how the site fits into the wider geological context. The group was introduced to the site's history and importance as a source of coal and fireclay. Doulton's Claypit provided an ideal opportunity to look in detail at Coal Measures geology, how it formed and the climatic conditions at the time. We were able to examine the relationship between the Carboniferous Coal Measures strata and underlying borderline Silurian-Devonian rocks, along the tubline and at Brewins Bridge.

The visit finished shortly after 4.00 as attendees had long journeys home. I would like to thank DGAG Members for visiting the Geopark and hope we will see them again either in Dorset or up this way. ■

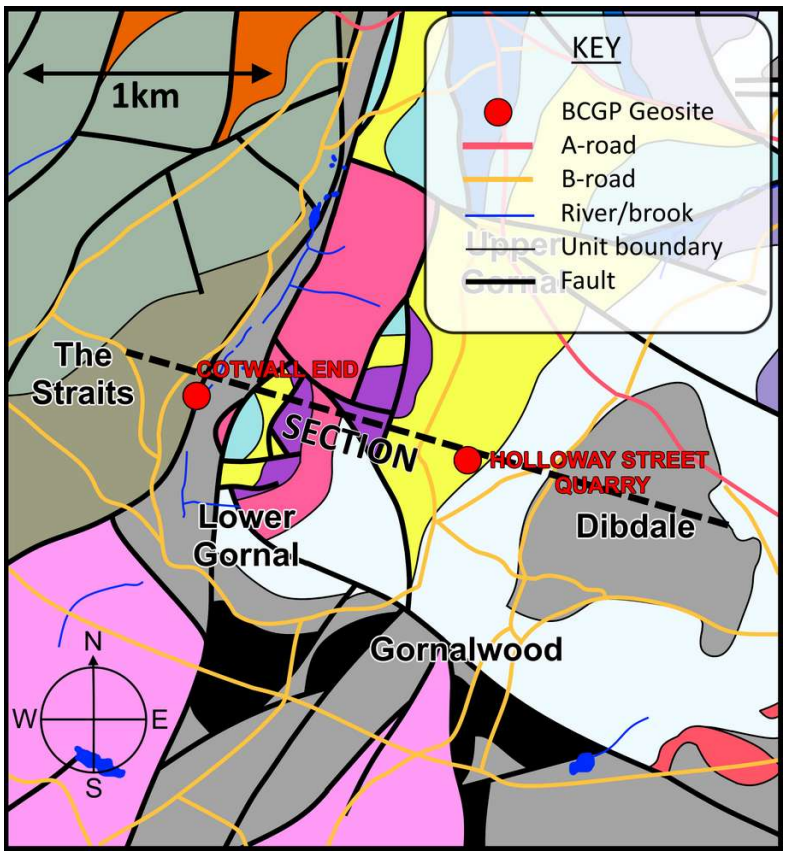
Andy Harrison

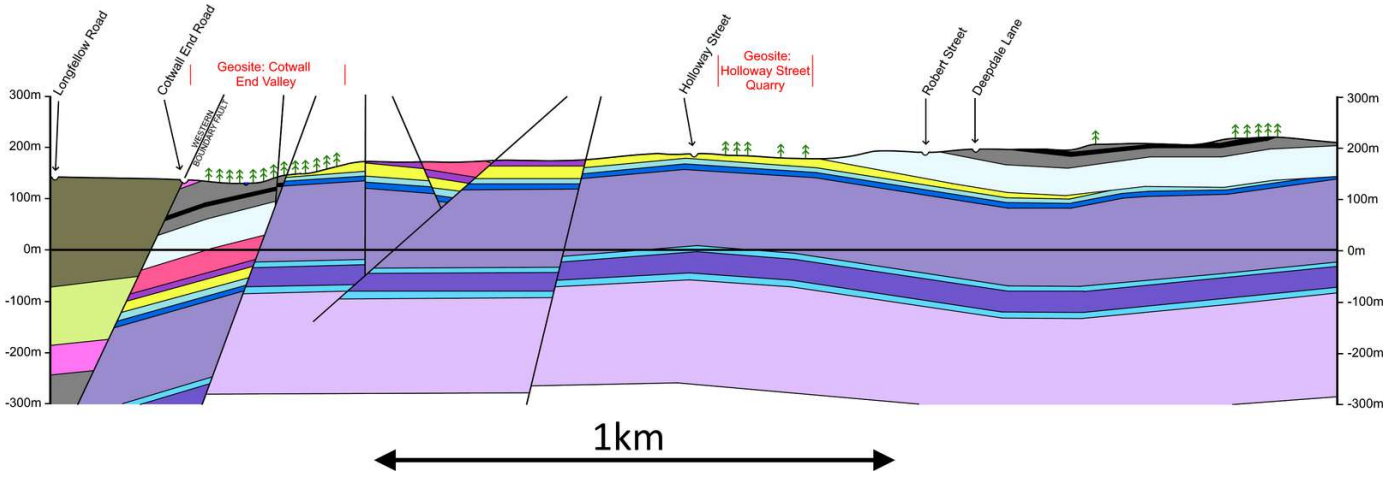
BCGS Committee – there is still a vacancy for Honorary Secretary!

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.

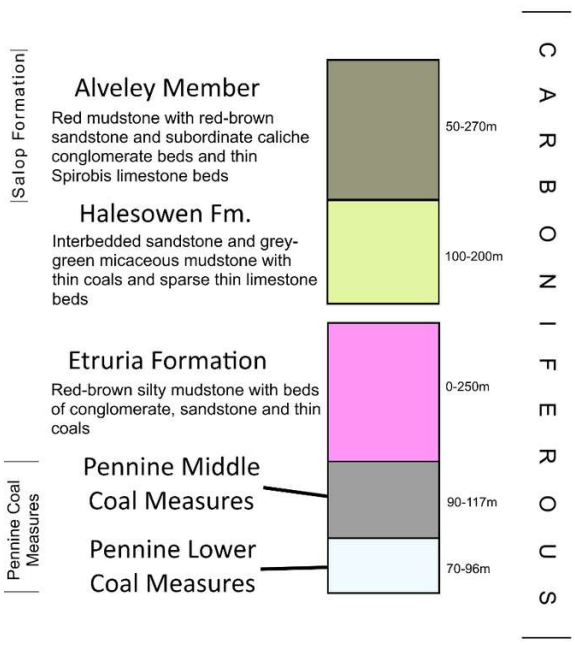
Matt's Maps No. 5 - Holloway Street Quarry

Two intervals of time define Black Country geology more than any other. The oldest is the mid-Silurian, when shallow seas hosted the incredible diversity of life found in the reef fossils at Wren's Nest. The second, more economically important period, was the Carboniferous, when vast swamplands generated what would become the coal that drove the Industrial Revolution. Between these two periods the area that is now England was in a state of transition. A continental landmass was moving closer and the sea level was shallowing. Rocks from these times are generally not well exposed in the Black Country, but Holloway Street Quarry is an exception to this. This Gornal geosite exposes the Downton Castle Sandstone Formation. The Formation is perhaps better known by its local name of 'Gornal Grit'.

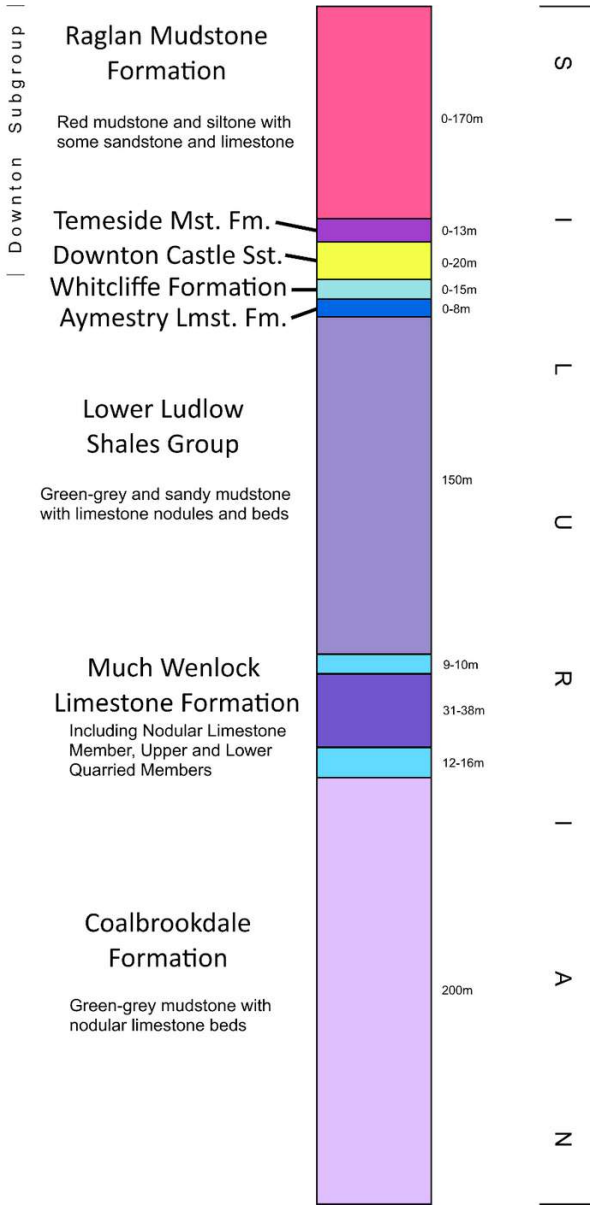




Gornal Grit, a type of sandstone laid down in a river delta 420 million years ago, is one of the hardest and most durable rock types found anywhere in the Black Country. As a result, it was widely employed as a building stone in the local area – and can still be seen in numerous 19th century walls and churches. Sandstone was both the literal and metaphorical bedrock of Gornal, with at least 5 separate quarries active early in the 1800s. The strip of green land nestled between Holloway Street and Hermit Street (collectively referred to as 'Holloway Street Quarry' here) was the main focus of this, with several quarries still in use during the mid-20th century. ►

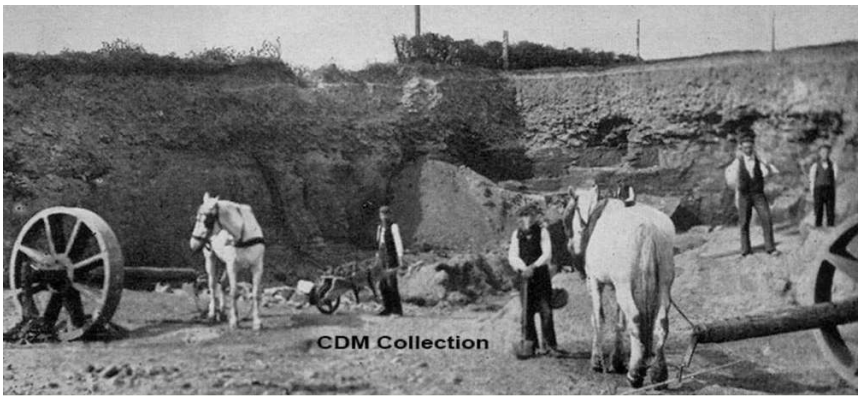


An image of a 3D model of the Gornal Fish (Hemicyclaspis murchisoni), now stored at the Lapworth Museum of Geology at the University of Birmingham. Model created by Luke Meade.



At Rollason's quarry (adjacent to Holloway and Ruiton Street), a remarkable discovery was made in the mid-20th century: an exquisitely preserved fossil fish unlike anything alive today, around 10cm in length, with a broad, bony headshield and no jaw.

This ancient fish belongs to the group Osteostraci (the bony-shelled fishes) and represents a fascinating moment in evolutionary history. These animals probably ate by lugging their spade-like heads along the muddy seabed, kicking up sediment and consuming any tasty morsels they could find. ►



Quarrymen and horses grinding Gornal Grit at Bagley Quarry, Gornal, circa 1900. Image courtesy of the Dudley Archives.

The Gornal fish (*Hemicyclaspis murchisoni*) is a truly noteworthy and unique fossil. Although fragmented remains of this and other fossil fish have been recovered from the Gornal quarries, no other fossil this well preserved was ever unearthed. It is very unusual for the skeletons of bony-shelled fishes to be recovered fully intact. Normally the head and bodies of these animals would separate after death, as the bony segments would disarticulate once the muscles had decayed. In contrast, the Gornal fish is preserved fully intact, and still closely resembles how it would have looked when it swam through late Silurian seas almost half a billion years ago.

Canals and railways made it easier to import harder-wearing building stones from further afield by the late 19th century, but the ever-savvy Gornal folk had more ways to market their product. Solid blocks of rock were ground down by horses pulling huge crushing wheels, and even Gornal's windmill was employed to grind down the grit. The sand produced was used for both industrial and for domestic purposes, such as scrubbing dirty pans and coating floorboards.

A reconstruction of the Gornal Fish as it would have appeared in life, by palaeoartist Nobu Tamora.

Rollason's quarry, the last place where Gornal Grit was cut from the ground, and the discovery location of the Gornal Fish, finally closed in 1971. You can still see an old Gornal Grit quarry face on the green land adjacent to Hermit Street, and a very small outcrop of Downton Castle Sandstone can also be seen along the tramway cutting at Saltwells.

It is one of the quirks of geology that unfathomably ancient sand was eroded from an extinct continent, transported along a long-forgotten river, exposed to immense pressure and turned into solid rock; and this rock was then returned to sand again 420 million years later for use in the households of the Black Country. With that thought I wish you all a Merry Christmas, and leave you with the old call of the sand merchants, otherwise known as 'Gornal Donkeys':

"Get your sond, get your sond. Ha'penny a bucket and some in your 'ond."■

Matthew Sutton

Although Cotwall End Quarry Geosite appears on Matt's map, discussion of this site will be the subject of a subsequent instalment of 'Matt's Maps' Ed.

Further reading

The University of Birmingham produced a short video about the importance of the Gornal fossil in the context of fish evolution. Click link here.

Here you can find an interactive 3D model of the Gornal Fish fossil itself. Click link here.

More information on the history of Gornal Grit quarrying can be found. Click link here.

BCGS Poet in Residence - R.M.Francis

Since you last heard from me, I've been putting the final touches to a manuscript of poems I've been working on over the last year and a half. I'm calling it the Chain Coral Chorus because I really like *Halysites* as an image and metaphor that ties the region's geological heritage to the industrial, communal and symbolic chains of the Black Country - the chains of the poetic trope spreading out in the same way as the colonising tabulate. There's something pretty beautiful about that, I think.

Just as Chain Coral forges its colony through building elliptical tubes that branch out in their gorgeous patterns, this work branches out in different thematic directions. During my time with the BCGS the work has developed into a strange mix of poems, micro-essays and poetic field notes all weaved together in a formal experiment. This form and genre hybridity has geopoetic pedigree. Scottish writer, Kenneth White, has used a three-pronged method in his earth writings. Poems, Travelogue and Essay all work together in what he calls his Landscape/Mindscape. Others have called this an archipelago form or method; where one body of work is set out and expressed in different clusters. I like this, it seems to fit this type of work which attempts to provide a crossing point between different fields of study, vernaculars and ways of seeing, and of course, has the earth and its histories at the centre.

I've also been busy working with film maker, Paul Stringer, on a short film that explores some of my ideas and some of the treats in the Black Country Geopark. We returned to Wren's Nest, Rowley Hills and Bumble Hole again in November to take more shots and record more poems. Paul is currently editing the piece and we hope to submit the film to some film festivals in 2022.

Speaking of the new year, I already have a date in the diary for my first workshop. Spelt Magazine is a poetry journal that specialises in place writing, nature writing and rural life, run by Yorkshire poet, Wendy Pratt. She's asked me to run an online Geopoetics session in January. To sign up click here.

This, I hope, will be the first of many more workshops (hopefully in the field with real people).

Finally, I want to wish you and yours a Happy Christmas. Eat, drink and be merry with loved ones! ■

R.M. Francis

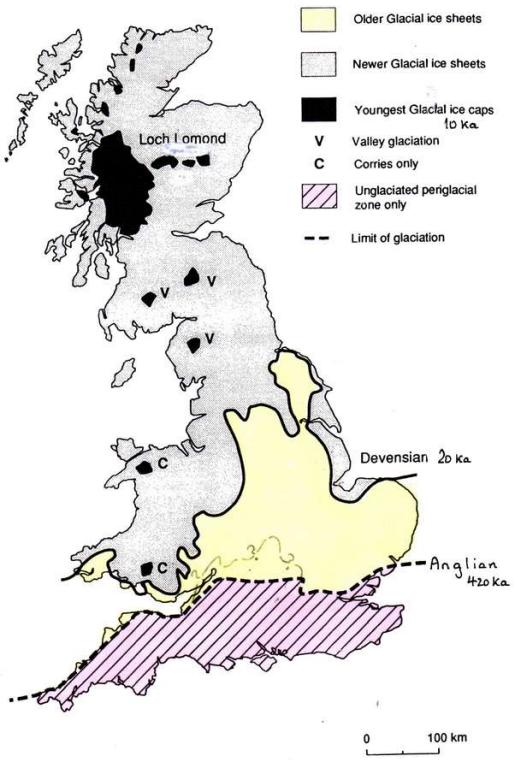
Mike's Musings No. 36

The World of Erratics

The topic of glacial erratics has occupied a good many column inches in the BCGS Newsletter for some while now, all relating to those found around the West Midlands. It will come as no surprise that such rocks can be found all over the country and beyond, so I'm taking the opportunity this column provides to raise their wider profile, with specific examples I have come across plus a few comments on some I haven't. ►

Cardinal sin... no scale! This is the Giant Erratic made of Rùm granodiorite, near Ben Feall, Coll. The face in view is approximately 15 x 5 metres

The term 'erratic' derives from the Latin 'errare', meaning 'to wander', and is ideally used to refer to large boulders that are of different material from the rocks in their vicinity, especially those that are sufficiently distinctive to be matched with a definite source. The term first appeared in 1779, when de Saussure drew attention to boulders from the Alps littering the Jura Mountains. He believed such blocks had been moved by water, though several workers (including Hutton) suggested ice was the real 'culprit', long before glacial theory became firmly established in the 1860s. Their value in establishing ice movement during glacial periods is now widely understood as, for instance, in separating different ice advances in the Birmingham area *(see map).*



Of course, erratics aren't always so 'foreign' to their surroundings, as they aren't always transported over long distances, nor are they necessarily large in size: but in these cases they are less useful or impressive. Moreover, there are other mechanisms for moving large rocks: movement by floods, carriage in the stomachs of large creatures (e.g. whales), entanglement in the roots of floating logs or masses of kelp, displacement due to rock falls, or, in modern times, by human agency; but these might best be excluded from a strict definition. On the tedious side, I have grown rather bored with the number of times 'giants throwing their weight around' have entered into local folklore to explain their presence!

The vast majority of recognised erratics, certainly in Britain, are associated with the Quaternary glaciations, with ice sheets spreading from the north (loosely speaking). It is therefore appropriate to look at specific erratics across the country beginning from that direction, and you don't get much further north in Britain than the 'Dalsetter Stone'. This modest, metre-wide boulder sits in a wall by the roadside in the eponymous hamlet on Mainland, Shetland. It consists of a very distinctive rock type known as tønsbergite, a variety of the better known Norwegian rock, larvikite, in which the feldspar crystals are deeply red in colour. This comes quite specifically from the Oslo fjord region, and is therefore associated with ice sheets spreading across the North Sea from Scandinavia (in this case from the east)!

The Lochmaben Stone near Gretna, looking out across the Solway Firth

Three distinctive erratics feature on the islands of Coll and Tiree. Coll boasts a truly enormous block of granite-pegmatite gneiss (unremarkable in this location) some 15x10x5 metres in size, perhaps 1,800 tonnes, looking forlorn in its isolation amidst an extensive, flat, grassy raised beach. Smaller, but more impressively perched on three small boulders, and near the 104m summit of Ben Hogh, the highest point on Coll, sits the 'Clach na Ben-Righ' or 'Queen's Stone' *(see front cover photo),* composed of grey gneiss common to most of the island. Tiree's contribution, the 'Ringing Stone', rests upon a stony raised beach and is composed of granodiorite similar to outcrops on Rùm. What makes this boulder special is its ringing sound when struck, which attracted Iron Age settlers who adorned the block with no less than 53 mysterious 'cup-marks'. ►

Staying just north of the Scottish Border, two further boulders of granodiorite (this time derived from nearby Criffel) may be found along the northern Solway coast: one, 'The Devil's Stone', on the foreshore at Arbigland; the other, the 10 tonne 'Lochmaben Stone'. This supposedly marks the site of the Battle of Sark in 1448 – just one of many such bouts of fisticuffs between the English and Scots. According to some sources it was formerly part of a stone circle, not the only time erratics have been put to such use.

Again, no scale but the 'high tide line' is at about head height if I remember correctly! This is the Goggleby Stone, near Shap

The Lake District has one familiar lithology that stands out in a crowd (in most city centres too!): the Shap Granite. There are many boulders of this in the Shap area itself (as well as misattributed erratics of local 'Borrowdale' volcanic rocks), particularly associated with a 'Stone Row' in which one suspects some rearrangement of the stones. Several of these have been given individual names such as the 'Thunder Stone' and 'Goggleby Stone' (which has required some assisted cementation to hold it upright!). On the outcrop of the Shap Granite itself rests 'Gray Bull', which clearly wasn't transported very far. Further erratics from this granite bestrew the countryside across northern England, one celebrated block being the 'Seamer Erratic' *(photo on P.19),* which certainly has been moved at least twice by man, from its original resting place, to a former position in the centre of a roundabout, to where it now rests more obscurely not far away beside the B1261, 200m west of Seamer Station.

One of the many Norber erratics This one has a better perch than most

Incidentally, the well known Lake District 'Bowder Stone', a huge block of volcanic rock set on edge in the Borrowdale Valley, is sometimes described as an erratic, which it probably isn't. This is more likely an example of a boulder fallen from above in the course of a landslide – although this may well have been prompted by ground stress release during paraglaciation.

Staying in Yorkshire, arguably the most famous erratics in the country are those at Norber, on the southern slopes of Ingleborough, where an array of Silurian 'greywacke' blocks, many visibly perched on rock pedestals, have come to rest upon a Carboniferous Limestone 'pavement'. It now seems that the once held idea that dissolution rates can be determined by simple calculation from age and 'pedestal height' is oversimplistic – another good story fallen to a deeper understanding!

Returning to the west side of the country, an unusual but colourful lithology for an erratic is now displayed in Coronation Park, Crosby (a suburb of Liverpool). According to an attached plaque, this 16 tonne block of gypsum was discovered in 1897 buried nearby in boulder clay to a depth of 6m, and presented in 1926 as a 'most remarkable relic of the glacial epoch'. Even more remarkable is that it doesn't appear to be slowly dissolving away in the wet Lancashire climate! ►

The Crosby Erratic, Liverpool - large mass of gypsum set on a plinth of assorted stone blocks

Rodin meets the Cannock Chase Erratic!

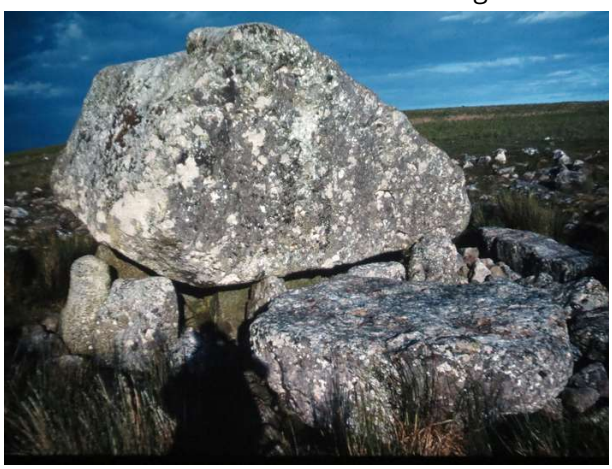
Moving on southwards we come to Cannock Chase, probably following an ice-stream that brought with it the 'northern' group of Black Country erratics. The Chase is an undulating area with much evidence of sculpturing during the 'Ice Ages', including several erratics. One in particular has been mounted on a plinth of cemented Triassic cobblestones, and features the granodiorite of Criffel (near Dumfries).

In the East Midlands, one area that provides ammunition for recognisable erratic lithologies is the elevated area of Charnwood Forest, from where both the eponymous volcanics and yet another granodiorite (from Mountsorrel) are derived. That this area was not completely smothered by ice sheets, but kept its 'head just above (frozen) water' is suggested by the absence of drift deposits over many of the highest crags. One erratic derived from a Charnian source stands proud in a small recreation area in Stretton-on-Dunsmore (close to the A5 / Fosse Way intersection).

The Erratic in the Park Stretton-on-Dunsmore

Another upland area in the Midlands, the Peak District, also has the potential to offer recognisable source material in the form of Carboniferous Limestone, and duly obliges some 90 miles to the south with a modest contribution to the erratic scene in the village of Soulbury, Buckinghamshire. This specimen is barely two feet high (and three wide, perhaps a mere two tonnes in all) and has a history of cropping up in local newsprint after unwary motorists have managed to try and reshape it, leading to calls to have it removed from the middle of the road where it has long resided. Indignant residents, who rightly take pride in their own piece of 'home-grown' glacial history, have so far succeeded in countering all such moves, and suggest that the lamp post that once stood alongside the boulder might, if reinstated, help motorists avoid any further accidents – "but kindly leave our stone alone"!

With this last erratic we have transgressed well beyond the Devensian ice limit (the most recent glaciation, ending around 11,000 years ago), into the area last glaciated during the Anglian ice advance some 420,000 years ago. Returning to the Devensian ice front, we find right on the limit, on the Gower Peninsula, 'Arthur's Stone', also known as 'Maen Ceti'. This 4x2x1.5m, 25 tonne block forms the capstone to a Neolithic burial chamber, and is somewhat precariously supported on nine plinth stones. Initially presumed to be of local 'Old Red Sandstone' lithology, more careful examination has shown it to consist of slightly less local 'Millstone Grit', and thus a little better (but not much) travelled than previously credited. ►



Arthur's Stone on the Gower Peninsula

The Seamer Erratic - Shap Granite

There has been much debate about the furthest reaches of the ice during the 'Ice Age', but most authorities would seem to agree that the south Cornish coast lay beyond its frigid touch (albeit within the periglacial fringe). One must therefore look to a further explanation for the presence of the 'Giant's Rock', a substantial block of very foreign looking garnetiferous gneiss on the wave-cut platform at Porthleven (near Helston). This rock type appears to have so far defied all efforts to find a match, with the suggestion that Norway, or even Greenland, might have been its original home. Moreover, it seems doubtful that it was carried into place directly by an ice sheet, so the suggestion that it represents a 'dropstone', delivered by a wandering iceberg, has been the most favoured explanation. Another more far-fetched suggestion is that a tsunami was responsible, which opens up a whole new range of possibilities!

This, then, is but a highly selective overview of British erratics. The rest of northern Europe, as well as the glaciated highlands (Alps etc.) also has its own distribution to offer, never mind the rest of the world! To find just how large erratics can get we need to look further afield – one claim to the world record is the 'Okotoks Erratic' (or 'Big Rock' - how unimaginative is that!), a 16,500 tonne block of quartzite in Alberta. If authentic, this is outdone by Kukkarokivi, near Turku, Finland, although it would appear to be an offshore islet rather than an isolated boulder. Weighing in at around 36,000 tonnes, one wonders at the power of ice transport, but I write with little authority on its validity. ■

Mike Allen


That troublesome rock at Soulbury, Bucks...
not quite the monster it sounds!
(But enough to bend a fender or two)


The Giant's Rock at Porthleven

Wishing you all a very Happy Christmas

Subscriptions 2022

Your next subscription is due on **1 January 2022** and there has been no increase. If you have previously opted to pay your subscription online, any standing order you have set up before 2020 should be cancelled. Our new bank account details (we are still with Lloyds Bank, as before), are as follows:

Name of account:	Black Country Geological Society
Sort Code:	30-90-89
Account Number:	43898960

You may be able to set up a new standing order online by using the information above, or if you prefer, it is possible to download a form from the BCGS website and after completing the required information, post or take it to your own bank. Date of first payment should be 4 January 2022 and then annually thereafter. For any new member who joined after 1 September this year, the subscription paid automatically covers them for 2022, so there is no need to pay again until 2023.

Other payment options are:
1) By making an individual online payment using the information above.
2) By writing a cheque and posting to the address below.

You may post your subscriptions to the Treasurer:

Alan Clewlow,
19 Manor Court Road,
Bromsgrove,
Worcestershire,
B60 3NW

email: treasurer@bcgs.info

Subscription rates:

Individual	£20 per annum
Family	£30 per annum
Full time student/Unemployed	£5 per annum

For members with a printed copy please enclose the completed slip below.
For members with an emailed copy please print this page and enclose with the slip completed.
Cheques should be made payable to **'The Black Country Geological Society'**.

✂----------

Please print clearly. Name: Mr / Mrs / Miss / Ms

Date: Email Address :

Address: Telephone:

I/we enclose £..... for Individual / Family / Student-Unemployed membership (please circle)