# Newsletter No. 276
# December 2022

The Black Country Geological Society

www.bcgs.info



**Copy date for the next Newsletter is Wednesday 1 February**

## Contents:



**Now there's a splendid *in situ* erratic!**
**To find out where it is, read on.**

**A Very Happy Christmas to you All**

| | | |
|---|---|---|
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| For enquiries about field and geoconservation meetings please contact the Field Secretary.<br>To submit items for the Newsletter please contact the Newsletter Editor.<br>**For all other business and enquiries please contact the Honorary Secretary.**<br>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.**

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

**Saturday 10 December *(Geoconservation Day):* Portway Hill, Rowley.** In collaboration with the Friends of Rowley Hills and the B&BC Wildlife Trust. Meet at St Brades Close (just off Tower Road) at 9.45 for 10.00 (Grid ref: SO 974 893), nearest PC: B69 1NH. Directions: from Birmingham New Road (A4123) turn left on to Tower Road if coming from Birmingham, right if coming from Wolverhampton. Just after Bury Hill park, turn left onto St Brades Close. Wear old clothes, waterproofs and stout footwear, and bring gloves. Tools are provided but feel free to bring your own. Also bring a packed lunch. Hot drinks provided. Finish at 1.30.

**Monday 12 December *(Indoor Meeting, 7.00 for 7.30 start):* Members' Evening and Christmas Social.** This is our annual chance for members to share their geological experiences in a sociable atmosphere with a Christmas buffet provided by the Society. Bring along some of your specimens for admiration, discussion and identification, and there will be a few short presentations from members.

**Saturday 14 January 2023 *(Geoconservation Day):* Dudley's Erratic Boulders in the Illey Valley.** TBC - details to follow.

**Monday 16 January *(Indoor Meeting):* 'Jurassic Gems of the Yorkshire Coast'. Speaker: Liam Herringshaw.** Liam is a palaeontologist, based in York. His PhD at the University of Birmingham (2004) was on the rare and problematical fossils of the Much Wenlock Limestone Formation, based primarily on museum specimens from Dudley. He has been a researcher at the universities of Aberdeen, Newfoundland, Durham and York, before becoming Lecturer in Geology at the University of Hull. Since 2020, he has been working with Yorkshire schools and museums, and is Director of the Yorkshire Fossil Festival. The talk will explore some favourite spots on the Yorkshire Coast, from Runswick Bay to Filey Brigg, told through the fossils and sedimentary rocks found there.

**Saturday 4 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 20 February *(Indoor Meeting):* 'Glacial Boulders at Wightwick Manor, Wolverhampton'. Speaker: Clive Roberts.** Wightwick Manor is a National Trust property in the western suburbs of Wolverhampton. The house was built in 1887 by the Mander family, who ran a successful family business making varnish and paint. One of the last owners, Sir Geoffrey Mander, was interested in landscapes and geology. He collected glacial erratics and other rocks of interest to be placed in the gardens. It is unclear how many originated on site, e.g. from lake excavations, and how many are from the local neighbourhood. There are 13 boulders on display, labelled as originating from the Western Lake District (e.g. Ennerdale granophyre) and the Scottish Borders (e.g. Criffel granite). Smaller erratics, locally derived rocks and slag boulders, can be seen in walls in the gardens. Future research hopes to fingerprint many of the glacio-fluvial derived rocks more precisely.

**Saturday 4 March *(Geoconservation Day):* Hay Head Quarry** (SP 050 990, nearest postcode: Walsall WS4 2JT). Directed by the reserve wardens. Details TBC.

**Monday 20 March *(Indoor Meeting, 7.00 for 7.30 start):* AGM followed by: 'Celebrating the Origins of Animal Life: Building a UNESCO Global Geopark in Charnwood Forest, UK'. Speaker: Jack Matthews** (Geoheritage Conservation and Interpretation Officer for the Charnwood Forest Geopark, UK). Charnwood Forest in Leicestershire is host to some of the oldest animal fossils in the world. This presentation will outline the internationally significant geodiversity of Charnwood Forest - including the outstanding ancient fossils - and the ways it has shaped the landscape, communities, and people of Britain's 'unexpected upland'.

**Saturday 1 April *(Field Visit):* Wroxeter Roman City.** Led by David Pannett (Shropshire Geological Society). Details TBC.

**Monday 17 April *(Indoor Meeting):* 'The origins of starfish and their relatives'. Speaker: Dr Aaron Hunter.**

**Saturday 20 May *(Field Visit):* Little Doward and Arthur's Cave.** Led by Jim Handley, EHT. Details TBC.

# Other Societies and Events

## Lapworth Lectures

**Monday 12 December: 'Dinosaurs, Middle Earth, and the Invention of the Deep Past'.** Speaker: Dr. Will Tattersdill, University of Birmingham.

Please keep checking the Lapworth Museum's website for details as we don't get much notice: Lapworth Lectures & Events Lectures are held in University of Birmingham, WG05 at 5.30.

## Woolhope Naturalists' Field Club - Geology Section

**Friday 20 January: 'Geology of the Antarctic'.** Speaker: James Cresswell, a geology tour guide to many countries including Wales, GeoWorld Travel.

Non-members of the Club pay £2. Visit: https://www.woolhopeclub.org.uk/meetings All meetings will be held in Hereford Town Hall. Friday evening meetings start at 6.00, Saturday afternoon meetings at 2.00 unless otherwise notified. Non members are welcome.

## Shropshire Geological Society

**Wednesday 14 December: 'Abberley & Malvern Hills Geopark'.** Speaker: Georgia Jacobs.

**Wednesday 11 January 2023: 'The NW Highlands controversy; geology, geologists and social climbing in Victorian times'.** Speaker: Peter Gutteridge, Cambridge Carbonates.

**Wednesday 8 February: 'The geology and geomorphology of West Cumbria and the geological disposal of high level wastes'.** Speakers: Dr James Lawrence and Sinead Birks, Imperial College.

Lectures are being held using Zoom and commence at 7.15 for 7.30. Some Lectures are now being held in person at the University Centre, Shrewsbury.
Further info: http://www.shropshiregeology.org.uk/SGS/SGSEvents.htm

## Warwickshire Geological Conservation Group

**Thursday 19 January 2023: 'Astronomical Cycles & Climate'.** Speaker: Jim Riding.

**Thursday 16 February: 'Birmingham Erratics Project'.** Speaker: Zoë Jackson.

There is a charge of £2.00 for non-members. This meeting is at 7.30 and is both live at St Francis, Leamington and by Zoom. For more details visit: http://www.wgcg.co.uk/ or email: WarwickshireGCG@gmail.com.

## Geological Society, West Midlands Regional Group

**Tuesday 10 January 2023: 'Ground subsidence associated with the dissolution of the soluble minerals within the Brooks Mill Mudstone and the Wilkesley Halite Member'.** Speaker: Josh Dunlop, Jacobs.

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 23 January: 'The Geology of Yemen: An Overview'.** Mr David M Hall, SulGeology Ltd.

Non-members £3. Talks take place in Martley Memorial Hall at 7.30. For further information contact John Nicklin, email: martleypfo@gmail.com or phone on 01886 888318 or visit: https://geo-village.eu/

# Editorial

There is plenty to inform, entertain and amuse in our final Newsletter for 2022. From Mike's detailed report of the Dingle trip and Andy's International Geodiversity Day report, to a pebble mystery posed by Adrian, an award for the Geopark, the Dudley Earthquake remembered by Andy and the Erratic Project's 'viral' poster, we come down to earth with a few good laughs in Mike's Musing.

Through the autumn months the Society has been getting back to normal with indoor meetings and the programme of geoconservation. It feels really good to be able to meet together again. More volunteers for the geoconservation work would be welcome, and we are still in need of a Meetings Secretary. Your Committee members are holding the fort, with special thanks to our Treasurer, Alan Clewlow who is still temporarily filling this post. But we badly need someone to take over this job as soon as possible! Please think about it and get in touch with the Secretary (details above) if you think you can help.

The schedule for next year is taking shape with a varied indoor programme, and venturing further afield for some interesting field trips. The field trips are organised for all of us, and attendance isn't always as good as we would like. Please make the effort! If transport is a problem, get in touch with Field Secretary Andy Harrison. It is often possible to share transport.

It remains just to remind you about the Members Evening – back to its old pre-Covid format. Please come along with your samples, or just to enjoy the short talks and the Christmas buffet. ■

*Julie Schroder*

# WMNP award for the Black Country Geopark

For the second year, the West Midlands National Park (WMNP) has run a competition to recognise projects that make an outstanding contribution to the quality of the environment and health and wellbeing of people living, working and visiting the West Midlands region.

In August, the Black Country UNESCO Global Geopark submitted an application and is celebrating after learning in November that it is one of twelve award winners. Applicants are assessed on several factors including how they prioritise people's quality of life within the environment; support community pride and health; collaborate across boundaries, and create community and environmental resilience. The application was followed by a 30 minute online interview and submission of a 2 minute video, all of which were assessed by a panel of scrutineers.

BCGS members will remember that in February the Director of the WMNP Lab, Kathryn Moore, gave an on-line talk for BCGS where she outlined the vision for the WMNP to act as a vehicle to help drive ►

regional social, economic and environmental change in the context of the local landscape. This award scheme exemplifies these aims, and it is gratifying to see that the Geopark has been honoured in this way.

The judges commended the Geopark for its inclusive approach, bringing together the four Black Country local authorities and its many communities into a single landscape. The Geopark was also commended for using its exceptional geological heritage for raising pride of place within the Black Country, and for elevating the profile of the whole region through achieving an international UNESCO designation for this special landscape.

The Geopark team has been a partner in another Nature recovery flagship project called 'Purple Horizons' which also won an award. It was particularly commended for its vision and holistic approach to Nature Recovery (geodiversity, biodiversity and community access to green space). This project aims to re-establish the heathland that once spread across south Staffordshire from Cannock Chase through the Black Country to Sutton Coldfield, creating diverse habitats so important to pollinators for the surrounding farmland.

Although very much in its infancy, the Black Country UNESCO Global Geopark is already having a very significant impact and winning recognition across the West Midlands. Dudley is proud to be the lead partner in this venture.

For more on the Geopark go to: https://blackcountrygeopark.dudley.gov.uk/bcg/
For more on the WMNP go to: https://www.bcu.ac.uk/research/making-a-difference/research-highlights/national-park-for-west-midlands ■

*Graham Worton and Julie Schroder*

## Subscriptions 2023

Your subscription is due on **1 January 2023** and there has been no increase. Our bank account details are as follows:

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

You can pay by making an online payment using the information above or by writing a cheque and posting to the address below. Please post your subscriptions to the Treasurer:

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**19 Manor Court Road,**
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email: treasurer@bcgs.info

**Subscription rates:**

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

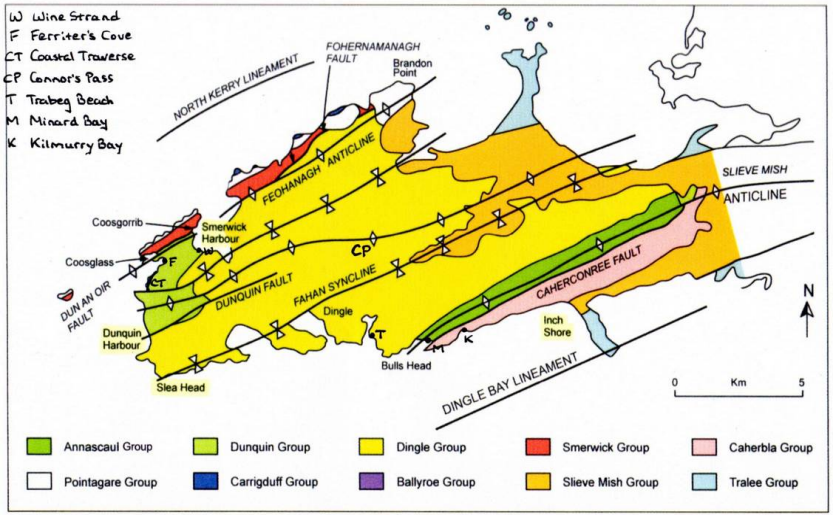
Cheques should be made payable to **'The Black Country Geological Society'**.
For any new member who joined after 1 September this year, the subscription paid automatically covers them for 2023, so there is no need to pay again until 2024.

# Field Meeting Reports

## 26-30 September 2022: Field Trip to the Dingle Peninsula, Ireland. Led by Prof. Ken Higgs.

A party of 14 people assembled at the Dingle Lodge Hotel having first come together 'en route' at Inch Strand: most of the group had travelled by air and coach via Cork, while three of us had made our own separate travel arrangements by car. Members will recall that this trip arose from a talk Ken gave to the Society during lockdown in March 2021, so we had all been looking forward to the occasion for over a year. We weren't to be disappointed.

*The BCGS Group at Ferriter's Cove, photo from Ken Higgs*




*The Dingle Peninsula Basic Geology showing locations mentioned (modified from Richmond and Williams, 2000)*

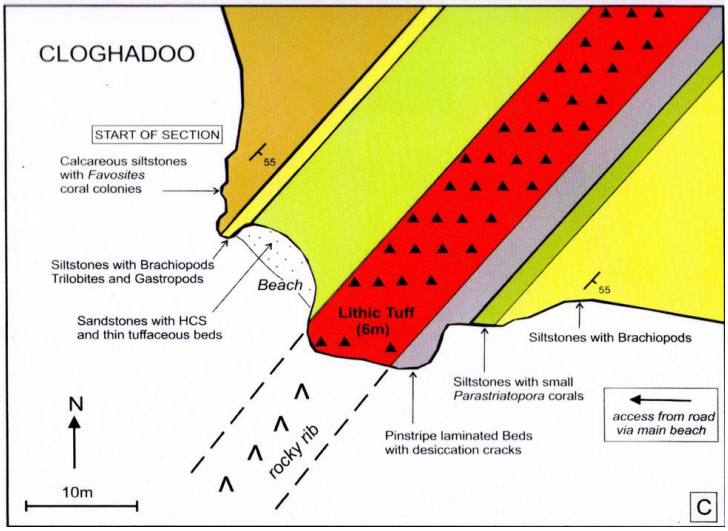
The Dingle peninsula is the geologically most diverse of Ireland's south-west peninsulas, and bears a strong Caledonian imprint across a series of ENE-WSW trending folds. It lies just to the south of the likely trace of the lapetus suture (i.e. it represents part of the ancient East Avalonian microplate). Much of the area comprises rocks of Devonian 'Old Red Sandstone' facies, with small headlands of Lower Carboniferous rocks. Two inliers of older Silurian and Ordovician rock are of particular interest.

I propose to describe the excursion in roughly 'geological order' to provide a more logical narrative of an otherwise disrupted order of site visits caused by inclement weather on the first full day. Ken offered what is perhaps the most comprehensive set of field notes I have ever encountered in the form of a sizeable tome: 'Geology of the Dingle Peninsula: A Field Guide', running to well over 200 pages of superbly illustrated and detailed descriptions covering the whole peninsula. Three days in the field was, obviously, insufficient to see everything that has taken much of a lifetime to produce! This account necessarily only describes (briefly and inadequately!) the geology included in our itinerary. ►

**Ordovician**

*Small scale isoclinal fold closures (near biros) and cleavage traces in the Illaunglass Fm., Minard Bay*

The oldest, Lower Ordovician, rocks are exposed within the Annascaul - Derrymore Glen Inlier, most readily inspected along its brief coastal exposure in Minard Bay on the mid-south coast. Two formations are present: the older Illaunglass Fm. forming low cliffs of secondarily red mudstones revealing two cleavages and many isoclinal fold closures, betraying a higher degree of tectonic deformation than anywhere else on Dingle. The overlying Bealacoon Fm. consists of sandstones and mudstones associated with mélanges deposited as high energy debris-flows in the abyssal depths of the Iapetus Ocean. It seemed remarkable that earlier authorities had failed to spot the seemingly obvious signatures of greater age, which was only confirmed when Ordovician acritarchs were discovered within some of the mudstones. These rocks suffered deformation in both early and late Caledonian events - equivalent to the Monian (pre-Wenlockian) and Acadian (late Emsian) orogenies elsewhere.




*Geology of the 'Cloghadoo Section', Ferriter's Cove*

**Silurian**

Attention turned to the Silurian rocks of the Dunquin Inlier, firstly with a visit to Ferriter's Cove on the west coast. Here, on a short (c.50m) traverse of the so-called Cloghadoo section, we were able to follow a single marine regressive cycle (1 of 5) forming the Ferriter's Cove Fm. of Wenlockian age. This begins with a series of offshore calcareous siltstones containing corals, crinoids and shelly fossils, through shore-face sandstones with hummocky cross-stratification, a volcanic tuff sequence, tidal-flat siltstones with desiccation cracks and finally a bed containing a coral, *Parastriatopora*, indicative of a lagoonal environment. One hypothesis suggests volcanic expansion and collapse as a control over local sea levels in producing these depositional cycles.

Overlying Wenlockian formations of the Dunquin Group were studied in a longer coastal traverse from Coolalea (near Ballincolla) to Clogher Strand, a short distance south of Ferriter's Cove. This covered the volcanic Clogher Head Fm., the fluvial and lacustrine deposits of the Mill Cove Fm., and finally the shallow marine storm-related sandstones of the Drom Point Fm. This simplified description belies a great deal of detail beyond the scope of this narrative, with much small-scale structural interest along the way - the coastline is highly indented with deep, fault-controlled inlets. ►

*Calymene trilobite, Ferriter's Cove Fm.*

The volcanic rocks are of particular interest as they are one of just four known instances of Silurian volcanism south of the Iapetus Suture across Eastern Avalonia (the others being in Skomer Island, in the Mendips and in the Tortworth Inlier). They are all broadly associated with a final burst of subaerial, sub-alkaline volcanism bringing a prolonged period of Llandoverian - Wenlockian arc-related subduction to an end. Much of the volcanic material consists of ignimbritic rhyolite tuffs and lavas, with welded (eutaxitic) and spherulitic textures pre-eminent. (Think of the Arenigian volcanic rocks in the entirely unrelated Birmingham and Black Country erratics!)

Other features of interest on this traverse included a peculiar 'Measles Rock' - a mottled ferricrete associated with the development of palaeosols due to the progressive weathering of a basalt at the top of the Mill Cove Fm., and magnificent bedding planes smothered in well-preserved *Chondrites* trace fossils in the Drom Point Fm. seen at Clogher Strand. Early geologists referred to these as 'fucoids', a misunderstood term I have heard used in respect of non-specific 'seaweeds'.

*Branching Chondrites burrows in the Drom Point Fm. at Clogher Strand*

In this western extremity of the Dingle Peninsula, lunch was enjoyed in the excellent facility of the Blasket Centre. This proved to be an extremely welcome refuge on two occasions when the heavens opened up at just the right time to provide an excuse for diving indoors!

Further south along the west coast, the faulted contact between the Drom Point Fm. (Silurian) and basal (Lochkovian) Bull's Head Fm. (Devonian), was seen from the steep cliff path leading down to Dunquin Harbour. This, the Dunquin Fault, marks the southern boundary of the Dunquin Inlier. Descending the cliff, three members of the Bull's Head Fm. could be contrasted: the lowest Paraconglomerate and Heterolithic members and the overlying Trabane member. Apparently a 'paraconglomerate' is a matrix-supported conglomerate deposited by ice or in a debris flow (as opposed to an 'orthoconglomerate' which is deposited by the more normal agency of flowing water). All this was news to me, and shows that you never stop learning new jargon! Conglomerates of either type are very often the first sediments to be deposited after a long hiatus in deposition.

*Desiccation cracks in the Bull's Head Fm., Dunquin Harbour*

The Heterolithic member included a bedding plane with a fine display of desiccation cracks, which supports other criteria indicative of a lacustrine, semi-arid environment. The younger Trabane member, seen at close hand at the foot of the cliff, included mudstone rip-up clasts derived from the dried out and curled up flakes of mud from the mud-cracked lake deposits. Overlying these beds is the Pragian Eask Formation, a thick sequence of alternating red and green sandstones and mudstones with an assortment of sedimentary structures which were deposited as sheets during flood events, each of which shows a reduction in current strength with time (i.e. a waning flow regime). This was also the first location where excellent boudinage structures could be seen, here in the form of 'ladder veins' infilled with quartz. Boudinage involves stretching of the rocks during tectonic events, (in this case the Acadian) and helps to deduce the stress regime. ►

*Taenidium burrows, Slea Head Fm.*

**Devonian**

Further south still, at the turn in the coast, we were able to inspect the eponymous Slea Head Fm. which is of Emsian age. This consists of a thick sequence of massive-bedded pebbly sandstones with thin mudstone horizons. Trough cross-bedding provides an excellent 'way-up' indicator in the coarser sandstones, and Slea Head is celebrated in the annals of Irish geology for being the place where Patrick Ganly, in the 1830's, first applied this observation to establish that the beds here were actually upside-down, on the southern overturned limb of a recumbent fold. (He didn't actually get round to publishing this concept until 1856, but was still 'ahead of the game'). Further interest was provided by the selective development of axial planar cleavage in the mudstones with just a crude and very imperfect fracture cleavage in the sandstones. One bedding plane also revealed the large trace fossil Beaconites (since renamed *Taenidium*), believed to be the burrow of an arthropod.

The Silurian - Devonian boundary was also seen at a distance on the west coast of Smerwick Harbour, from the Dún an Óir headland. This vantage point provided a view across an inlet, Coosgorrib, where the Fohernamanagh Fault does the same job as the Dunquin Fault, but on the northern margin of the Dunquin Inlier. Some authorities elevate this fault to a terrane boundary. The precise identity of the Silurian rocks on which the headland stands isn't clear, but they are most probably equivalent to the marine Ferriter's Cove Fm. or Clogher Head Fm. The basal bed of the Devonian on the far side of the fault is an 8m. thick Coosgorrib Conglomerate Fm. which consists of a massive-bedded, clast-supported, polymictic orthoconglomerate in a purple sandstone matrix. The clasts have been noticeably flattened and stretched within the plane of the bedding. This is unconformably overlain by the fluvial Farran Sandstone Fm. which includes cross-bedding, desiccation cracks and various trace fossils, including Taenidium.

Together, these formations are coeval with the Glashabeg Conglomerate Fm. investigated nearby at Wine Strand. The beds here are something of a contrast, consisting of upward fining cycles of red-bed conglomerates, sandstones and mudstones. The coarser lithologies contain rip-up clasts and fragments of jasper (the significance of which will become clear) while the mudstones commonly include calcrete nodules and rhizocretions (root structures) associated with soil development. A flash flood in a braided river environment produced a sharp and erosive contact between the mudstone of one cycle and the basal conglomerate of the succeeding cycle.

*Rhizocretions in the Glashabeg Conglomerate Fm. at Wine Strand*

From Trabeg Beach, on the southern coast of the peninsula, a wider Devonian succession could be followed in the cliffs all the way south to Pointnarianna with the prominent sea-stack 'Shirragh'. Here the Bull's Head Fm. (Lochkovian, basal Lower Devonian) is unconformably overlain by the Cappagh Sandstone Fm. (the penultimate ►

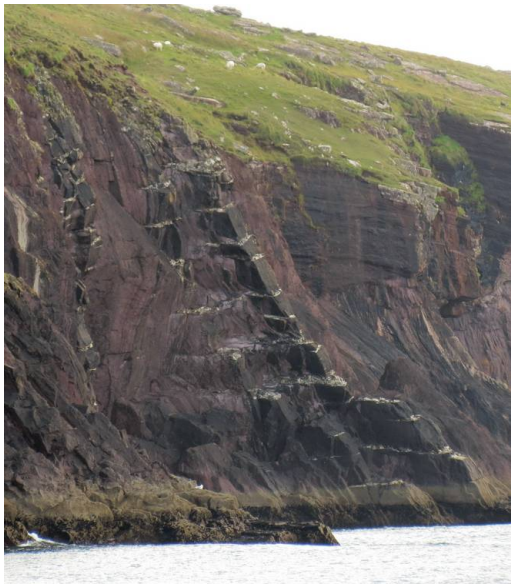
*Erosive base between conglomerate and mudstone: Glashabeg Conglomerate Fm., Wine Strand*

Upper Devonian unit) - the sharply angular 'plane of unconformity' standing out clearly in the distant cliffs. This might be regarded as Dingle's answer to Hutton's celebrated Siccar Point in Scotland.

Closer to Trabeg, red sandstones of the Pragian Eask Fm. could be seen, again with conspicuous quartz filled 'ladder veins' (cf. Dunquin Harbour). This was followed by a local deposit, the Trabeg Conglomerate Fm. which formed the higher cliffs along Trabeg Beach itself. These beds consist principally of matrix-supported breccio-conglomerate bands, distinctly polymictic in character with clasts of sedimentary, metamorphic and volcanic lithologies, but lacking any jasper. This, you may recall, is in contrast with the Glashabeg Conglomerate Fm. in the north; the explanation being best summed up in terms of three coeval formations - a central easterly flowing river (Slea Head Fm.) with two lateral tributaries flowing in from north and south, each with their own hinterland source rocks providing the contrasting conglomerate formations. Finally, the western end of the beach offered a glimpse of the overlying Emsian Ballymore Fm. with its development of calcrete horizons.

*Angular Unconformity between the Upper and Lower Devonian at Pointnarianna Cliff*

The Middle Devonian, absent in these cliffs, is represented further east along the south coast of the peninsula, by the basal Inch Conglomerate Fm. seen by the roadside above Inch Strand, and the overlying Kilmurry Sandstone Fm. seen, naturally enough, in Kilmurry Bay.

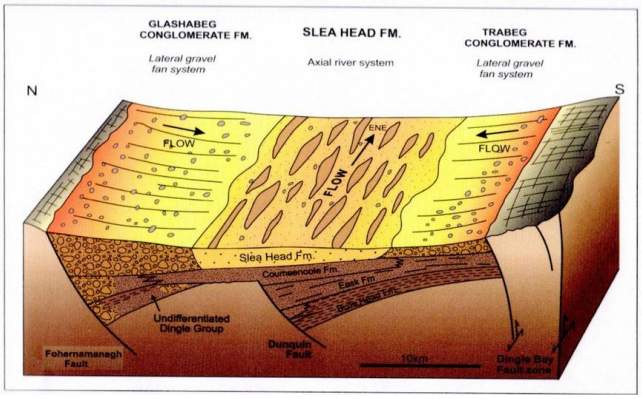


*Quartz filled 'ladder veins' in the Eask Sandstone Fm. at South Cove, Trabeg*

The conglomerate is largely clast-supported, locally imbricated or cross-bedded, and of varying coarseness, with everything from boulders to pebbles, predominantly of high-grade metamorphic lithologies such as schist, gneiss and mylonite. The source of this material isn't clear as no such rocks are present in south-west Ireland, but a Precambrian metamorphic upland to the south (now buried offshore?) is inferred.

The sandstones in Kilmurry Bay are different from anything so far described amongst the Old Red Sandstones, being of aeolian origin - massive dune-set sandstones with frosted and rounded grains. Inland they contain a varied array of trace fossils, mainly produced by terrestrial arthropods showing that even Devonian deserts weren't, by any means, devoid of life. Thin siltstones, representing fluvial episodes, are interleaved within these beds. ►

*Storm beach at Kilmurry Bay: well smoothed cobbles from nearby Kilmurry Sandstone cliffs*

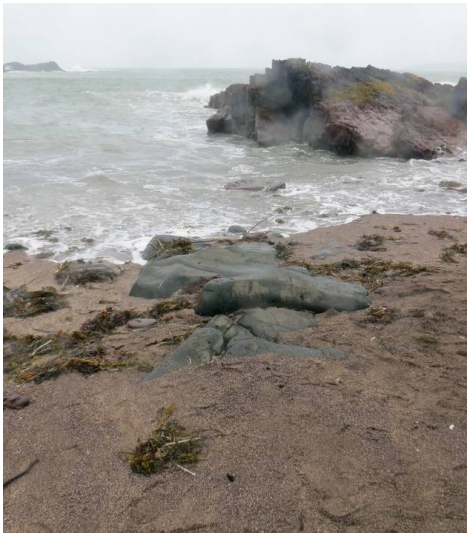



*Relationship between the coeval Slea Head, Glashabeg Conglomerate and Trabeg Conglomerate Fms. (mod. from Todd et al. 1990)*

The conjunction of widely spaced bedding planes and orthogonal sets of regular, wide spaced jointing produces sandstone blocks that break up and erode into well rounded cobbles which have accumulated nearby into an impressive modern-day storm beach.

**Palaeogene and Pleistocene**

The youngest geological features on Dingle include Palaeogene dykes (one of which was seen at Wine Strand, dated at 42Ma, some 15-20Ma younger than most of the British Palaeogene Igneous Province elsewhere), and 'Ice Age' features. The coastal outcrops revealed plenty of glacial drift deposits *(see front cover photo for an in situ erratic, Trabeg beach)*, but the most interesting aspect of this chapter of geological history was, to me, the splendid glacial striae exposed on ice-polished surfaces above the Connor Pass. Other typical glacial landforms adorn the majestic high ground of the Brandon Massif, but these were only seen from the roadside.



*Palaeogene dyke at Wine Strand*

In conclusion, I would like to offer a huge vote of thanks to Ken Higgs for his enthusiastic and lucid leadership and to Alan Clewlow for his logistical organisation. Group travel by minibus around the narrow, meandrine and confusing road network on Dingle greatly added to the fluency of the occasion and our hotel proved an excellent base in all respects. ■

*Mike Allen*

*Glacial striations on ice-smoothed crags above the Connor Pass*

**References**

Three diagrams taken from 'Geology of the Dingle Peninsula: A Field Guide' by Ken Higgs & Brian Williams, with permission.

Other images are by the author and the editor.

## Thursday 6 October: International Geodiversity Day

To celebrate the rocks, minerals, fossils, landforms, soils and natural processes that directly influence our natural environment, landscapes and where and how we live, UNESCO have established this new annual event. Thursday 6 October saw local volunteers and wardens gather to celebrate the world's first International Geodiversity Day, which also coincided with celebrations for 70 years of National Nature Reserves (NNRs).

*Wren's Nest Miners Memorial*

Our hosts for the day were Graham Worton (BCGS and Dudley MBC) and Dr Jonathan Larwood (Principal Advisor on Geodiversity at Natural England). We met at the Wren's Nest visitor car park off Wren's Hill Road on a sunny and mild autumnal morning. In attendance were volunteers and reserve wardens from the Friends of Wren's Nest and the Friends of Saltwells nature reserves, the Black Country Geological Society and the Dudley Canal and River Trust.

Graham started with some introductions and what this special day involved before handing over to Dr Larwood who continued with some background to its inception. The Black Country UNESCO Global Geopark was an appropriate location to launch this day, which included Wren's Nest NNR, the Dudley tunnels and canal, and the Saltwells NNR. The event also coincided with the Geologists' Association's Festival of Geology and they sponsored the canal boat and a coach to drive attendees from Saltwells back to the Canal Trust's visitor centre.

The day was one of many firsts. Apart from being the world's first international geodiversity day and the Wren's Nest being the world's first national geological nature reserve (declared in 1959), this was also the first time a trip including Wren's Nest NNR, the Canal Tunnels and Saltwells NNR had been undertaken on the same day.

*Park Head locks*

The event was all about bringing together those volunteers and people who make the local nature reserves what they are and to share experiences. Before setting off from the car park, thanks were given to all volunteers for their work across the Black Country followed by a round of applause.

From the Wren's Nest visitor car park, we undertook a circuitous route along the reserve's western side to the Seven Sisters Caverns before returning via the Ripple Beds. From Wren's Nest, we drove to the Canal Trust visitor centre for lunch before boarding a canal boat for a guided tour through the Dudley tunnel and beneath the ridge to emerge at Park Head locks. We then continued along the Dudley Canal to the Saltwells NNR and disembarked at the Brewin's Bridge cutting before following the tubline to the new visitor centre and wardens base adjacent to the Saltwells Inn. We finished with refreshments at the visitor centre before we boarded the coach back to the Canal Trust.

The day ended on a positive note for geodiversity and we look forward to 6 October 2023. ■

*Andy Harrison*

# Birmingham's Erratic Boulders: Heritage of the Ice Age

## 'Missing Boulder' poster goes viral!

In my October report, I mentioned that we attended the Bournville Heritage Day at Rowheath Pavilion and I included an image of our 'Missing Glacial Erratic Boulder' poster, with the casual comment: "We also raised awareness of a missing boulder of enormous size. We would love to solve this mystery during the course of the project! Can you help?" *(See poster in Newsletter 275, October 2022.)* We were hoping this would stir up some local interest, but what happened next was beyond our wildest dreams!

*'Volcano' demo, Family Day at Lapworth Museum*

It all started when a BBC reporter, Richard Williams, spotted the poster and wanted to do an article for the BBC News website. He spoke to Beth Andrews, our project manager, who got in touch with me to supply him with some photos, and she casually agreed that it would be OK for him to contact his Midlands Today colleagues. Beth was duly contacted on the Thursday 13 October by Midlands Today - could the project team be ready to meet the TV outside broadcast team the following morning? Beth frantically tried to contact all the main players in the project, and some of us were able to meet BBC Midlands Today reporter Ben Sidwell and a cameraman in the temporary exhibition space at the Lapworth Museum as requested - it was then or never!

Four and a half hours later, we'd briefed Ben and taken him round some of our prime sites - including Rowheath, the 'home' of the missing boulder. This resulted in a 3 minute item on Midlands Today that evening. But that was just the start! The item was repeated on BBC Breakfast TV the following Monday - giving the project nationwide publicity. On 19 October Richard Williams' article was put up on the BBC News website here: https://www.bbc.co.uk/news/uk-england-birmingham-63289734 then Beth was contacted by Radio WM the day after Richard's article appeared, and she did wonders for the project with a superb live interview. If that wasn't enough, that same day 'Missing Boulder' articles appeared in The Guardian, and the Daily Telegraph!

For a couple of weeks the project team was inundated with 'sightings' on all social media platforms. Volunteer co-ordinator Zoe Jackson and several project team volunteers spent many happy hours following up with site visit and replies.

*Inspecting the big Illey Valley erratic (see below) Ken (left) marks the buried far corner!*

Beth was interviewed on Radio WM again several days later - had the boulder turned up? No! Though an enthusiastic group followed up a map reference to a 'stone' marked on an early OS map of the Rowheath area. The site is now part of a housing estate, and there was no sign of the boulder!

I also noticed that the magazine 'Down to Earth' has picked up on the story, with a reader's report in the November issue of the quarterly magazine which also appeared in the December on-line 'Down to Earth Extra'. ►

Although the media homed in on this 'missing boulder' aspect of the project, our main focus is to preserve and raise the profile of those we know about - and keep searching for undiscovered ones. However, solving this mystery and locating any other 'lost' boulders would be a hugely satisfying bonus!

Although this amazing publicity has dominated our 'Erratic World' recently, in November there was another very successful 'Fire and Ice' themed Family Day at the Lapworth Museum, and there is plenty of work going on behind the scenes to prepare for the launch of further trails next year, and install information panels at strategic locations. The Trail 1 leaflet has proved so popular that a 2nd edition is currently at the printers! Historic research and field work continue, and perhaps most exciting on this front is that the largest boulder of all lies within the Illey Pastures SSSI and this is in Dudley! Moves are afoot thanks to Graham's intervention to get permission to clear and reveal this boulder in all its glory *(see photo above)*. A provisional date of 14 January is earmarked for this work. *(This erratic had an earlier mention in Newsletter 271, Feb 2022, p. 18.)* Don't miss the opportunity to join the workforce and be amongst the first to set eyes on this monster erratic for well over a hundred years! ■

*Julie Schroder (BCGS rep. Erratics Project steering group)*

For more information:
https://erraticsproject.org/ https://www.facebook.com/birminghamerratics
https://www.twitter.com/erraticsproject https://www.instagram.com/erraticsproject

# Conglomerate Pebble Mystery

On a walk along a local route west of Alfred's Well, Bromsgrove I discovered a pebble in a stream bed that did not appear to be from the locality, a well worn clast of quartz-rich coarse conglomerate *(see photos 1, 2 and 3)*.



The pebbles typically found throughout the area (associated with sandstones and mudstones) are the reddish-brown and white quartzites supposedly eroded out of the Triassic river bed sediments of the Budleighensis braided drainage system that flowed north from mountains as far away as present day northern France. The general description of this Triassic river bed formation, given in a selection of references (*1, 2, 3, 5)*, state that the content is unsorted and the pebbles are by weight 80-90% quartzite (usually liver or greyish coloured) and vein quartz (usually white). They are well rounded, varying in size from ¼ inch up to and maybe exceeding 9 inches in diameter. A minority of other lithologies have been reported including tourmalinized rocks of Devonian age, chert, Carboniferous Limestone, schists and a variety of igneous rocks including some agates. The lack of sorting suggests that they were deposited by torrents of fast flowing water, typically in a delta fan setting. However, the mystery is that ►

none of the descriptions above appear to match the quartzite pebble in question. Nevertheless, until an alternative source can be confirmed, the bed from which the conglomerate pebble was dislodged is most likely to be somewhere in the Kidderminster Formation at the base of the Sherwood Sandstone Group. (The Kidderminster Formation was previously known as the Bunter Pebble beds.)



The basal conglomerate of the Kidderminster Formation, containing pebbles and quartzite, according to the BGS Redditch geology map, sheet 183 *(ref. 4),* was well exposed in the large Marlbrook Lane Quarry (SO 982 747) in the 1970s but the quarry has now closed and has been back filled. Typical pebbles from the quarry found on a visit organised by Peter Rogers of the Sheffield Amateur Geological & Lapidary Society in 1976 are shown in photo 4. None of these look like the one found (compare with photo 1). The only photo of the pebble beds *in situ* I have found so far is in Old, R.A., Plate 3, p. 10, *(ref. 3)*.

Whilst pondering where the conglomerate pebble last came from it is interesting to consider the earlier geological steps it may have taken. The rock cycle could have been repeated a number of times before this but how many as a minimum?

Well-meaning friends and associates have offered suggestions as to the origin of the conglomerate pebble. These include a drop stone from glacial activity and erosion debris from the Elan Valley Caban Coch conglomerate. However, closer review of the evidence with the assistance of a retired geology teacher OUGS member has ruled these out. At the present time the only answer seems to be that it has come from a specific source in the long Variscan mountain range in an area where northern France is now.

Some questions for consideration:

Are there any other pebbles with similar lithology?

Can we be more specific as to the possible source? ■

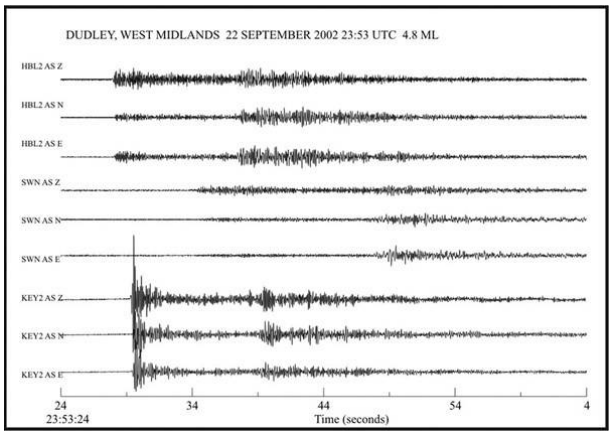
*Adrian Wyatt*

**References:**

1) Wills L. J. (1950), 2nd Edn, The Paleogeography of the Midlands, University Press of Liverpool.
2) Wills L. J. (1976), The Trias of Worcestershire and Warwickshire, Report No. 76/2, NERC, Institute of Geological Sciences, HMSO.
3) Old, R.A. et al, (1991), Geology of the country around Redditch, NERC, British Geological Survey, HMSO.
4) British Geological Survey 1:50 000 Series, (1989), England and Wales sheet 183, Redditch.
5) Bennison, G.M & Wright, A.E.; (1976), The Geological History of the British Isles, Edward Arnold; p.274.
6) British Geological Survey Lexicon of rocks.

# Remembering the Dudley Earthquake - 20 Years On

Members may have noticed that the penultimate weekend of September 2022 marked 20 years since the event that literally shook the Black Country.

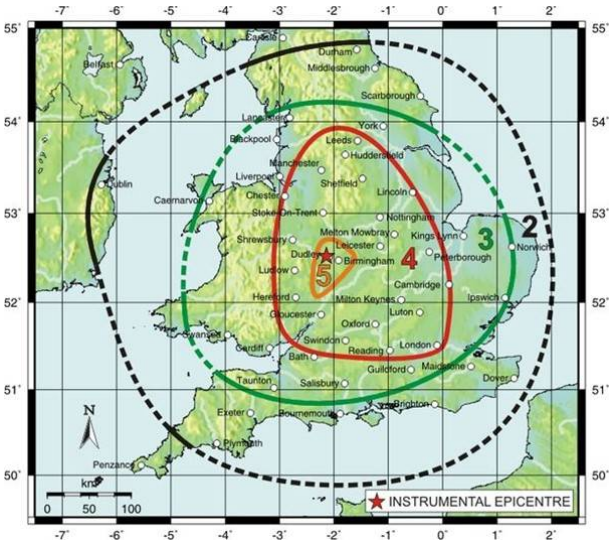



Having not long moved to a flat in Wolverhampton, I had gone to bed on the Sunday evening after attending my first Dudley Rock and Fossil fair over the weekend. I remember being suddenly woken by a loud bang and a slight rumble whilst loose plaster cascaded down the internal wall cavity to my room. My first thought was that the boiler next door had exploded, but I soon realised that I had just experienced my third 'earthquake'.

The Dudley 'earthquake' as it has come to be known occurred at 23.35 on Sunday 22 September 2002, lasted 20 seconds and measured 4.8 magnitude *(see seismograph image above).* More of a tremor than an earthquake, it has been recorded as one of the largest such events in the UK since the 1990 earthquake in Bishop's Castle, Shropshire that measured 5.1 magnitude. The shockwaves were felt far afield, from the Black Country and Birmingham, across Shropshire and Staffordshire and out as far as North Yorkshire, London and Wiltshire. The shockwaves were also reported as far as Southern Ireland and France.

At the time, local media reported on terrified and frightened residents having left their homes and the police having received over 5,000 calls enquiring about what had happened. Local people reported hearing a loud bang, their houses and other buildings violently shaking, alarms sounding, power outages and folk wandering the streets in their night clothes. Not realising what was happening at first, many thought that a lorry had ploughed into their homes or there had been a gas mains or bomb explosion. According to the British Geological Survey (BGS) the tremor was equivalent to 'an explosion of 1,000 tonnes of TNT or a small nuclear weapon'.

The following day, damage from the tremor could be seen and included split stonework and tumbled bricks at Dudley Castle and fallen chimney pots, masonry and roof tiles from houses, a church spire in Walsall and various other buildings across the region. Luckily there were no casualties.




Afterwards, the BGS recorded two aftershocks: on 23 September 2002 at 03.32, measuring 2.7 magnitude, and on 24 September 2002 at 09.29, measuring 1.2 magnitude. The epicentre was located using P-wave and S-wave measurements from several seismograph stations, which indicated it to be approximately 1km west of the Western Boundary Fault and at mid-crustal depths around 14km. At the surface, the epicentre location was on the junction between High Arcal Road and Himley Road. ►

Together the steeply dipping Eastern Boundary and Western Boundary Faults define the West Midlands Coalfield and sit on the roughly north to south trend known as the Malvern Axis. Following the Hercynian/Variscan Orogeny, extensional tectonic forces during the Triassic caused the two faults to be downthrown and form a basin in which early Mesozoic sediments were deposited. The current landscape was shaped from later glacial activity and human exploitation of the region's mineral wealth through the 18th and 19th centuries. It is believed that relaxation along fault lines in the Atlantic led to the event felt on 23 September 2002.

According to the BGS, the UK sees low to moderate seismic activity that generally has a diffuse spatial distribution. Historical and instrumental earthquake data suggests that, on average, an earthquake around 4.7 magnitude or greater occurs once every 10 years.

Since the 2002 'Dudley Earthquake', seismic events in the Birmingham and Black Country region have included:

- Bartley Green, Birmingham, (8 October 2005): Magnitude 1.7.
- Selly Oak Park and Gibbins Road, Birmingham, (2003): Magnitude 1.3.
- Sandwell area, Sandwell, (12 November 2011): Magnitude 1.5 to 2.
- Sutton Coalfield, Birmingham, (20 April 2013): Magnitude 0.5.

Other seismic events in the Midlands felt further afield since 2000 include:

- Budbrooke, Warwickshire (23 September 2000): Magnitude 4.2.
- Melton Mowbray, Leicestershire (29 October 2001): Magnitude 4.1.
- Wolstanton, Staffordshire (8 June 2005): Magnitude 2.6.
- Market Rasen, Lincolnshire (27 February 2008): Magnitude 5.2.
- Bromyard, Herefordshire (27 October 2008): Magnitude 3.6.
- Ludlow, Shropshire (1 June 2012): Magnitude 2.5.
- Loughborough, Leicestershire (19 January 2013): Magnitude 2.9.
- Oakham, Rutland (17 April 2014): Magnitude 3.2.

On average the UK experiences over 100 'earthquakes' every year but these are typically around 1.0 to 2.0 magnitude and occur in isolated places and so largely go unnoticed. However, we are still awaiting our next seismic event of similar magnitude to the Dudley 2002 'earthquake' in the Black Country. Further information relating to earthquakes in the UK can be found on the British Geological Survey website (www.bgs.ac.uk). ■

*Andy Harrison*

# Murchison in the Library – postscript

*In the last issue Mike Williams drew our attention to his discovery of a volume of Murchison's 'Silurian system' in the library of an unspecified stately home. Mike Rosenbaum (SGS) picked up the threads and provided some further insight into this story as reported below by Mike Williams (Ed.)*

Murchison's Silurian System, a benchmark volume in the history of stratigraphy, was published in 1839 following a public subscription. From the list of subscribers it is likely that this volume was sponsored by the Earl of Burlington of Burlington House, London - today the home of the Geological Society of London. ■

*Mike Williams*

# Mike's Musings No. 42: 'Laughing Again - More Howlers'

With the season of festivity and jollification approaching, I think we are all perhaps ready for a bit more light-hearted fun from my source of merry-making, that book of geological howlers (with due acknowledgement to the Geological Society of Glasgow), which still shows no sign of running out of mirthful material!

I'll begin with this thought relevant to the current obsession with climate change *(howler quotes in **bold**):*
**"At one time Wales was a steaming jungle."**
It's the apparent incongruity that lends humour to a not unreasonable assertion about Wales in the late Carboniferous period. It can still be quite sweaty 'down in the valleys' on a hot summer's day!

In contrast, but very much the notion going around when I was a lad, was the belief:
**"According to the experts, computers and Jehovah's witnesses we are about to have another ice age."** Humanity's contribution to global warming may have put this on ice, so to speak!

Meanwhile on the not unrelated subject of coal, did you know that:
**"Carboniferous trees fell down because they were soft and pithy inside."**
And nothing to do with decay - despite the fact that:
**"Coal is decayed vegetarians."**
And with so many folk turning to vegetarianism these days, perhaps a return to the Carboniferous is in sight!

And what is more:
**"Over the range from about 450°C to upwards of 500°C, coal passes through a phase of elasticity during which it can be moulded between the fingers like putty."**
But please don't try this at home! It'll make a dreadful mess of your oven, and as for your delicate little digits... ouch!

On the subject of temperatures and coal (mines):
**"The rise in temperature with depth can be shown by dropping a thermometer down an old shaft. For every mile the instrument drops the temperature increases by 17°C."**
But you'll need a pretty deep mineshaft, a very robust thermometer, and a snappy way of reading the instrument as it passes by, to get any useful results from this procedure.

It seems obvious that at least one of these coaly notions is contrived; in similar vein:
**"There are three kinds of rocks, ingenious, sedentary and metaphoric."**
I mention this because of its relevance to a current alternating theme amongst my Musings.

Likewise, the following two offerings are also rather tired, and, dare I say, juvenile efforts.
**"The Law of Superposition: young things in beds are better than old things in beds."**
Book title: **"Crumpled Bedding: true confessions of an amorous geologist."**
Much in the mould of the 'Confessions of a...' series of films that did the rounds in the 70s - very much on the level of silliness some of my fellow students (not myself, of course!) were guilty of when signing field trip accommodation guest-books under the names of 'Terry Bratula', 'Cecil Benthos', 'Basil Pinacoid' etc. ►

But the gold medal for contrivance this time around goes to:
**"The Parallel Roads of Rob Roy were made when the level of the lake fell three times as the Highlanders cleared the log jam that held up the water, and so enabled him to escape to his hiding places near the head of the River Spey when he was chased by the Hanoverian soldiers."**
Geography and History sound perhaps; Geology less convincing.

But one can be amusing on this subject without probably realising it:
**"The Parallel Roads of Glen Roy are an unparalleled example of this phenomenon."**

Now, I've never been very good with names either, so perhaps the authors of the next two contributions are musicians who likewise get things confused:
**"The theory of continental drift was first propounded by Weber."**
**"We have come a long way since Wagner proposed a flight from the poles."**
'Plate Tectonics - The Musical'... now there's an idea! (The name both are groping for, of course, is Alfred Wegener.)

Physical Geography and Sedimentology of rivers seem to provide fertile territory for going astray:
**"An ox-bow lake is formed when a river meanders, suddenly reverses and moves in the opposite direction."**
That I'd like to see.
**"When the river reaches old age, the gradient of the land is virtually nil and rivers have to find their way to the sea by some other method apart from flowing in a straight line. So it meanders, i.e. flows from side to side to gain as much speed as possible to reach the sea."**
Fascinating stuff.
**"Grains transported in solution by rivers are not well rounded."**
A little more thought / concentration required here!

In some cases it is difficult to find any fault - mainly because nothing has been said:
**"The colour of a mineral depends upon the contents of minerals which would give colours like white, yellow, brown, black, grey...".**
Clearly a candidate for high political office, but I'd give up any other aspirations!

Mineralogy can be a confusing subject, and it seems that kaolin in particular comes with problems for many students. Curiously all these quotes were supplied by the same contributor (but, I presume, not the same candidate), which begs a certain question...?
**"Kaolin is of course china clay. It is called china clay because it is used for making china. It is also used for making poultices, but it is not called poultice clay."**
Accurate at least - even if little less vacuous than the preceding item.
**"Kaolin is a clay formed by the weathering of boulders. Hence it is called boulder clay. Boulder clay is made by ice, and kaolin is a well known constituent of ice and is put into ice-pack poultices if you have a headache from overwork."**
This fascination with poultices suggests both candidates attended the same course.
**"Kaolin is easily identified since it is always found with feldspar. Feldspar is either monoclinic plagioclase or its identical triclinic twin orthoclase. This is why it is always difficult to distinguish plagioclase from orthoclase."**
If the question were about kaolin, the answer didn't offer very much - perhaps as well, judging by the candidates grasp of the feldspars. ►

And still on the kaolin theme. As in many walks of life, simple honesty has an endearing quality, and might just be the best policy:
**"What is kaolin? This is a difficult problem. It is a mineral** (good - 1 mark so far), **since everything in geology is a mineral.** (Good work undone, even if true). **You can find out its composition by difficult chemical analysis that only lecturers can do. Where it is formed is something of a mystery. I think weathering has something to do with it,** (good) **but not much** (oh dear!) **I wish the lecturer would tell us. I remain baffled."**
Pass me the poultice please.

Vacuous answers are a common occurrence, in this case on the subject of palaeontology:
**"Fossils are of general interest to the amateur geologist because they provide an interesting relief from other forms of geology and are nice to collect."**
Now I wonder what other forms of geology he could mean? Crystallography and Optical Mineralogy had me reaching for a head poultice many a time!

Structural Geology, with its demand for seeing things in three dimensions, often causes problems:
**"A strike fault being a sideways movement will show all the right outcrops on the map but in the wrong places."**
This had me thinking back to the celebrated Morecambe (and Wise) gag with Andre Previn about playing all the right notes... but not necessarily in the right order. However, somehow, you get a general idea of what the candidate is trying to say...
**"I tested both sides of the fault with dilute HCl acid to see which had been thrown down."**
...which is not quite the case here.

Finally, I finished my last musing (on metamorphism) with a note that I would be returning to a particular subject. Many technical terms can be quite daunting when it comes to the correct spelling. But I imagine another gold medal is due for this item - the attempts by 22 students from the same class at PORPHYROBLAST. (I do wonder how genuine this is!)

| | | |
|---|---|---|
| Paphyroblast | Porphroblast | Porphyrobast |
| Porpyroblast | Porpherablast | Porphropclast |
| Porphryobast | Porphyoblast | Phorphroblast |
| Porphorblast | Phorphyroblast | Phorpheroblast |
| Phoroclast | Phorphroclats | Porphroclast |
| Phorclast | Phorphoclast | Phorphroclast |
| Phroclast | Phrophroclast | Porphryoblast |
| Porphyroclast * | Parphroblast | Porphoblast |
| Pophyroblast | Porphoroplast | Phorphoroblast |
| Porphonoblast | Porphoroblast | Poryeroblast |
| Poryroblast | Prophyroblast | Blastophyres |
| Blastoporphyrocrysts | Prophyros | Great Jumping Metacrysts (my favourite) |

* Note that this, as it happens, really is another bit of genuine gobbledegook!

And I can't tell you how bad I felt inflicting this upon your newsletter editors - the most damnable thing to type I've ever been confronted with in my life. Thirty six different answers from 22 students. Sounds a bit like the variety of answers you get when you put a simple question to 22 professional geologists!!! ■

*Mike Allen*