Newsletter No. 297

June 2026

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To find out more, read on!

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Copy date for the next Newsletter is Monday 1 August

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For enquiries about field and geoconservation meetings please contact the Field Secretary.
Please notify Andy Harrison in advance if you will be attending these events.
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, and Facebook.

Future Programme

Indoor meetings are now held in the Lamp Tavern, 116 High St, Dudley, DY1 1QT 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 13 June *(Field Meeting):* Dudley Museum and Archive. Leader: Graham Worton. Meet in the downstairs foyer of the Archives Building, Tipton Rd, Dudley DY1 4SQ (Grid ref: SO 950 912), at 10.15 for a 10.30 start. Graham will take us on a guided tour of the building and the museum exhibitions, detailing the move in 2016/2017 when the old museum closed, the change in circumstances and change in purpose and design of the new museum. Graham will also talk about the function and setting as the headquarters and orientation centre for the Geopark. During the day it is likely that there will be some fossil identification and craft activities going on in the Education Room. Plenty of free car parking is available around the Archive building. Finish: 12.30 – 1.00.

Sunday 5 July *(Field Meeting):* Burton Dassett, Warwickshire. Leader: Ray Pratt. Joint event with the Warwickshire Geological Conservation Group. Meet at 10.30, Burton Dassett Country Park car park. Grid ref: SP 395 522. (*Car Parking at Burton Dassett costs £3.50 per day. Payment by card or cash.)* The park was created in 1972 from a complex of former quarries and intervening disturbed ground, mostly overgrown but with some good exposures of the Liassic Marlstone Formation. This site incorporates several stratigraphic units and lithologies ranging from the Lower Jurassic Dyrham Formation to the Middle Jurassic Northampton Sand. Trip duration: 2 – 3 hours. A packed lunch is recommended, or the Yew Tree pub which is in Avon Dassett. Please register for this trip with Andy: fieldsecretary@bcgs.info. *For further information see the flyer on the BCGS website. See also a short WGCG video on the geology of Burton Dassett: https://youtu.be/p6oUfmzB3yQ*

Saturday 25 July *(Field Meeting):* Bewdley Museum and Bewdley. Leaders: Liz Cowley and Andrew Harrison. Meet at Bewdley Museum, Load Street, Bewdley, DY12 2AE (Grid ref: SO 786 753), 10.15 for a 10.30 start. The day will involve a morning guided tour of the museum by Liz Cowley (Collections and Interpretation Officer). In the afternoon there will be a guided walking tour taking in the geological features around Bewdley town. There is no parking at the museum. Nearest car parks: Redthorne House CP (immediately behind the Museum), access from High Street. £5.60 for 8 hours **card only.** OR Lower Load Street Long Stay Car Park (opposite the Museum), £7.00 all day, cash or card. OR Gardners Meadow CP, Bewdley DY12 2DP, Pay and Display (7 min walk to Museum). Food is available at the museum or bring a packed lunch. Finish: 3.30-4.00.

Monday 21 September *(Indoor Meeting):* Details TBC.

Monday 19 October *(Indoor Meeting):* 'The Ediacaran Biota of Charnwood Forest: the behind the scenes story'. Speaker: Dr. Mike Howe (Chief Curator and Head of the National Geological Repository at the British Geological Survey). There are several speakers talking on the results of the work and the implications for the origins of multicellular organisms, but I believe that original discovery of the fossils around 1849 and their subsequent erroneous discrediting, plus the pivotal role played by a local society – Section C, LLPS (Leicester Literary & Philosophical Society) – in reinvigorating Ediacaran research in the UK, makes an equally interesting story.

Monday 16 November *(Indoor Meeting):* Details TBC.

Other Societies and Events

Geologists' Association

Sunday 5 July: Llandudno: A walk through the Visean - the growth and demise of a Mississippian carbonate platform. Leader: Cathy Hollis

Registration Fee: £5 GA Members / £15 non-member. For more information visit: https://geologistsassociation.org.uk/ukfield/#5july

Warwickshire Geological Conservation Group

Sunday 5 July, From 10.30 to 2.00: WGCG & BCGS Joint Field Trip to Burton Dassett. Led by Ray Pratt (see BCGS programme above for details).

For more information visit: https://www.wgcg.co.uk/ or email: WarwickshireGCG@gmail.com.

East Midlands Geological Society

Saturday 25 July: Day Excursion to the Middle Jurassic of the Stamford area - Ketton Quarry and Barnack Stone. Leader: Mark Barron.

Further info: www.emgs.org.uk

Lapworth Lecture

Monday 15 June at 5.30: 'The strengths and limitations of satellite-based landslide monitoring through real-world case studies'. Speaker: Dr Benedetta Dini (Assistant Professor at the University of Birmingham and a Researcher at the University of Milan-Bicocca). When the ground moves (and we miss it): what satellites can (and can't) tell us about landslides.

Venue: Lecture Theatre WG12, (Aston Webb Dome & Semi-Circle, University of Birmingham, Edgbaston, Birmingham, B15 2TT). The lecture is free to attend and open to everyone, and is available to attend in-person on campus or on Zoom. For more information: https://www.birmingham.ac.uk/facilities/lapworth-museum/events

Mid Wales Geology Club

Wednesday 17 June: 'The making of Snowdonia, ancient volcanoes and glaciers'. Speaker: Paul Gannon.

Further information: Web: http://midwalesgeology.org.uk lectures start at 7.15 and are a hybrid of in-person meetings at Plas Dolerw, Newtown, SY16 2EH and via Zoom. Those wishing to join a meeting remotely should contact the secretary, Chris Simpson, at christopher_s@btinternet.com

Geological Society

Tuesday 23 June at 6.00: 'Exploring ancient Mars with the Mars 2020 Perseverance rover'. Speaker: Dr Keyron Hickman-Lewis, Lecturer in Planetary Exploration at Birkbeck, University of London. https://www.geolsoc.org.uk/events/exploring-ancient-mars-with-the-mars-2020-perseverance-rover-public-lecture/

Tuesday 21 July at 6.00: 'Mineral and Earth Pigments in Art and Architecture'. Speaker: Dr Ruth Siddall, geologist and materials scientist whose work explores the intersections of Earth sciences, art, archaeology and cultural heritage. She specialises in the study of minerals, rocks, pigments, ceramics and historic building materials. Ruth is recognised for her expertise in pigment analysis and is co-author of The Pigment Compendium: A Dictionary of Historical Pigments.
https://www.geolsoc.org.uk/events/mineral-and-earth-pigments-in-art-and-architecture-public-lecture/

These lectures are free to attend by Zoom or in person at Burlington House, Piccadilly, London, W1J 0BG.

Abberley and Malvern Hills Geopark – Geofest 2026

The annual Geofest is running from 23 May to 30 August. More on the Geofest Calendar here.

For further information go to: http://geopark.org.uk/ or contact the BCGS Field Secretary, Andy Harrison (details on p.2).

Editorial

An unexpected award ceremony and our the long-planned presence at the Perton Library Science Fair have kept some of us busy over the last few weeks. It's also good to note that there have been a few visits to Smestow Valley Nature Reserve in the last few months, meeting the reserve wardens and the Friends of Smestow Valley group. The first geological conservation session involving BCGS took place there a few weeks ago. This was very successful and we hope that the Smestow Valley Nature Reserve will now become established in our range of geoconservation sites.

There is a varied programme for you over the summer, starting with a Dudley Museum visit on Saturday 13 June led by Graham. Even if you've been before, don't miss the chance to go round the museum with Graham! There's always something new to learn, and there's plenty to see. Further afield in Warwickshire, a chance to immerse ourselves in the Jurassic world of Burton Dassett is a treat in store. Also the lovely town of Bewdley in Worcestershire and its delightful Museum have a wealth of geology to keep us well occupied.

This issue of the Newsletter has much topical material on offer - from the local Perton Library Science Fair, through Andy's report on the recent BCGS field trip to the Ercall, to the massive subject of James Hutton and specifically the new 'Deep Time Trail' at Siccar Point in the pages of Mike's Musing. This was carefully timed to coincide with the Tercentenary of Hutton's birth in Edinburgh on 3rd June 1726.

As always, I must take this opportunity to put in a plea for more of you to volunteer to join us on the committee. We need new ideas, and some of you must have skills which would help us to run the Society as efficiently as possible. Don't be shy! Please contact Mark: honsec@bcgs.info if you would like to help us out on the committee. It can be fun!

I also look forward to hearing from you with geological holiday tales and photos. Please help to keep up the long-standing success of our Newsletter! ■

Julie Schroder

Geoconservation and Field Meeting Reports

Saturday 14 March (Geoconservation Event): Portway Hill, Rowley. Led by the Birmingham and Black Country Wildlife Trust and Friends of Rowley Hills.

Unfortunately, no Wildlife Trust staff were able to attend this event, so we were unable to undertake the usual planned works to clear the dolerite (microgabbro) exposures. Thankfully, Friends of Rowley Hills members were available and able to provide some tools and a plan.

The morning was cool and dry with a slight breeze and sunny spells when we met at St Brades Close for 10.00. We spent the day helping the Friends Group clear bramble and scrub from in front of the main dolerite exposure to provide a more open habitat for wildflowers. ►

Dolerite rockfall at Portway Hill

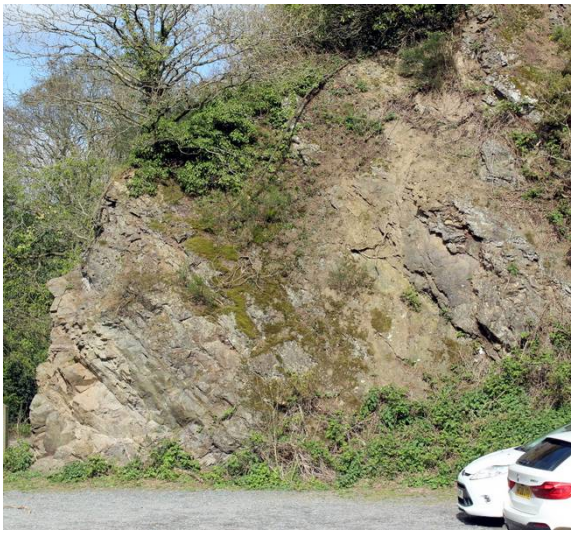
Clearing bramble and scrub from the ground in front of the main dolerite exposure

A large rockfall had occurred at the exposure's southern end, where recent bramble and scrub clearance had taken place. Large, angular and broken dolerite boulders revealed fresh blue dolerite surfaces, reflecting the quarry's original name - Blue Rock Quarry.

The rockfall acted as a reminder as to why, in some cases, too much vegetation clearance may not be a good idea. Whilst roots of bramble and hawthorn may weaken and destabilise rock faces, they can also act to bind rock and soils together. Indeed, some plants, such as shallow rooted burnet saxifrage, thrive on exposed rock faces without damaging them. As the dolerite grew warm in the sun, offsetting the early spring coolness, beetles, ladybirds and jumping spiders became active and began foraging between cracks for food. We finished shortly after lunch, at around 2.00.

Saturday 11 April (Field Event): Ercall Quarries, Shropshire. Led by David H Smith (Shropshire Geological Society).

Very variable weather conditions, ranging from cloud and sunny spells to heavy downpours, accompanied our visit to the Ercall Quarries, Shropshire. We met David Smith at the Forest Glen Car Park at 10.15 for an introduction to the day. This started with a look at exposures within the car park, itself a former quarry, before walking northwards, up the road to The Ercall Quarries.



Forest Glen Quarry Car Park

Located approximately 6 km west of Telford town centre, immediately north-east of The Wrekin, the Forest Glen and Ercall Quarries are accessed off Ercall Lane. The Forest Glen quarry is cut into a small hill - Lawrence's Hill which rises to around 235m Above Ordnance Datum (m AOD). It is situated immediately north of The Wrekin. North of Lawrence's Hill sits The Ercall, a small, elongate north-east to south-west trending ridge that rises to around 265m AOD within the southern end of which are the five numbered Ercall Quarries. In 1974, The Ercall's northern end was cut through when the M54 motorway was constructed.

Rhyolite exposure in Ercall Quarry 1,

The quarries were worked over 300 years ago for raw materials used in local China clay production at nearby Coalbrookdale. Today, the Shropshire Wildlife Trust runs the Forest Glen car park and The Ercall quarries as a nature reserve, which includes ancient woodland, scrub, bare rock faces and localised wetland habitats. The underlying geology provides ►

well-drained and acidic soils for many shrubs, including bilberry, climbing corydalis, heath bedstraw and gorse, and other wild flowers. During our visit, numerous bluebells, violets, dandelions, plus blackthorn and cherry blossoms were in bloom. We also heard and saw many birds, including blackbirds, great tits, nuthatches, chaffinches, wrens, chiff chaffs and green woodpeckers, all of which call The Ercall Local Nature Reserve 'home'. In turn, many insect species can be found here, including various rare butterflies such as speckled wood, dingy skipper, green hairstreak and the wall butterfly.

The reserve's underlying geology, which has influenced its biodiversity and industrial heritage, generally comprises various volcanic, intrusive and metamorphosed sedimentary rocks that date from the Precambrian (around 680Ma) to the Cambrian (around 540Ma).

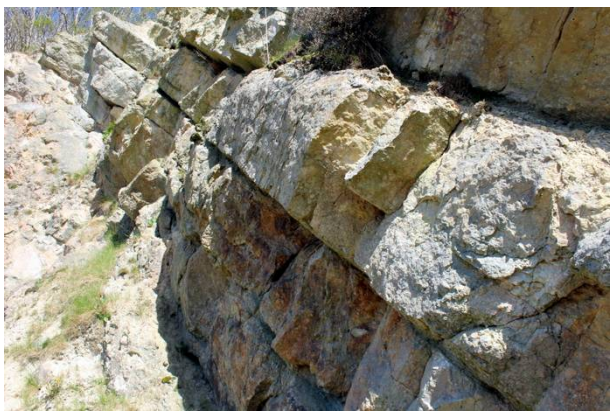
Precambrian - Uriconian volcanic tuffs, basalts, rhyolites and intrusive dykes

The oldest (Precambrian) rocks are best seen within the Forest Glen quarry wall exposures. The lower parts include steeply dipping, fine-grained, grey ash (tuff) layers with angular blocks of blasted volcanic material and rounded pebbles, or 'bombs', formed from molten lava flying through the air. Forming the upper parts are overlying darker, basaltic layers that represent flood basalts erupted onto the earlier ash covered landscape. Intruding the tuffs at the quarry's western end are sub-vertical, dark and fine-grained dolerite dykes that represent later intrusive volcanic activity.

The quarries within The Ercall Quarry Nature Reserve are identified as Quarries 1 - 5. Only Quarry 1 (Bottom Quarry), Quarry 2 (Ercall Middle Quarry) and Quarry 3 (Ercall Top Quarry) are accessible with visible exposures. Quarries 4 and 5 are very overgrown and choked with vegetation.

Ercall Quarry 2, north wall exposures

Approximately 50m into Quarry 1 from Ercall Lane, we saw tall exposures of orange-brown flow banded rhyolites and pebbly pyroclastic material. Erupted from the same Precambrian volcanoes as the Forest Glen car park volcanics, these rocks represent a change in magma chemistry from basic runny lava, to more acidic, viscous lava. The flow banding results from different minerals crystallising out of the melt at different temperatures and being drawn into lineations as the lava flowed. The Wrekin is also formed from the same flow banded rhyolite. Intruding the rhyolite on the quarry's eastern edge is a basalt/dolerite dyke, like those seen in the Forest Glen quarry. The dykes were intruded during a later volcanic episode around 563Ma.



The Wrekin Quartzite Conglomerate

Precambrian - Ercall Granophyre

Quarry 2 comprises a relatively flat and grass covered floor leading to terraced, partly tree and scrub covered benches forming the northern quarry wall. Exposed on the upper terrace are an acidic, pinkish, fine-grained type of granite (or granophyre), known as either Ercallite, or, by the British Geological Survey (BGS), as The Ercall Granophyre. This rock forms ►

the north-east shoulder of Ercall Hill and was intruded around 560Ma into the earlier volcanic complex that produced the tuffs, basalts and rhyolites seen in the Forest Glen Quarry and Quarry 1.

Cambrian - Comley Series: Wrekin Quartzite Conglomerate/Wrekin Quartzite Formation and Unconformity

Flanking the granophyre to the east and west, in Quarry 2, are younger Cambrian quartzite rocks belonging to the Wrekin Quartzite Formation. This stratum comprised repetitive conglomerate (or breccio-conglomerate) layers interbedded with thin bluish-grey siltstones or silty shales. The conglomerates include orange-brown, brown and grey, angular to rounded clasts of rhyolite, granophyre and other older rocks in a finer, sandy to fine gravel sized matrix, indicating an earlier Precambrian origin. The interbedded shaley bands represent thick, muddy layers that (following burial and over time), became consolidated to their current thickness.

The Wrekin Quartzite profile seen in Quarry 2 continues into Quarry 3 as bedding planes forming the northern wall, and once again in profile, within the eastern wall. Distinctive ripples cover the quartzite beds forming the northern quarry wall. In the eastern wall, the quartzite layers are heavily fractured and veined with infilling barytes, formed during later hydrothermal mineralisation episodes. According to David, exactly the same features could be seen within the quartzite beds on the western side of Quarry 2.

The Wrekin Quartzite ripples

An irregular unconformity marks the boundary between the Cambrian Quartzite and the underlying Precambrian rocks. Best seen in the north-east corner of Quarry 2, the unconformity represents approximately 50My of missing time between the Precambrian and Cambrian. This time window represents a period when Precambrian high ground was being worn down to a lower-lying landscape that eventually became buried beneath sediments belonging to the overlying Wrekin Quartzite Conglomerate.

Cambrian - Comley Series: Lower Comley Sandstone

Quarry 3, Comley Sandstone Formation

Forming the tree-covered southern wall of Quarry 3 are thickly bedded, greenish-grey glauconitic sandstone strata belonging to the Cambrian Lower Comley Sandstone. Representing the youngest layers seen at the Ercall Quarries, this stratum comprises rounded quartz grains with subordinate feldspar. This stratum also includes occasional thin mudstone layers indicating quieter, low energy deposition and fossils (trilobites and brachiopods), which indicate a definite marine origin.

Locally defining the base of this stratum is a second unconformity and conglomerate layer that ►

contains earlier Precambrian (Uriconian) volcanic clasts. This unconformity represents another uplift and erosional episode following the deposition of the Wrekin Quartzite Formation.

Structure

Noticeably, the older Precambrian rocks have been tilted and folded to steeply dipping angles, around 40° to 80°, in a north-easterly direction. This deformation is believed to have occurred around 540Ma as Precambrian highlands were being eroded and prior to the deposition of the Cambrian quartzites. Together, Ercall Hill, Lawrence's Hill and The Wrekin lie on a major north-east to south-west trending fault system known as the Church Stretton Fault Zone. Lying within the Church Stretton Complex, this fault zone also includes the Long Mynd, Lawleys and Caer Caradoc further south. Dating from the Precambrian, this fault zone represents a lineament where two geological terrains (the Cymru Terrain to the west and the Wrekin Terrain to the east), meet. At the end of the Silurian, around 400Ma, Caledonian tectonic forces reactivated this fault zone and uplifted the Lawley and Caer Caradoc Hills.

In Quarry 2, we saw two locations with exposures showing slickensided surfaces and a melange of broken up rock types forming a mylonite, or fault breccia. Both locations represent later, localised faulting trends in a general east to west and south-east to north-west orientation. Movements along these faults resulted in the younger (Cambrian) Wrekin Quartzite being thrust eastwards up over the earlier Precambrian rocks and hence the quartzite outcrops seen in the western wall of Quarry 2.

Palaeogeography and Environmental Setting

During the late Precambrian, the UK sat roughly 60° south of the equator. Geochemical analysis of the tuffs, rhyolites and basalts found in Forest Glen Quarry and Quarry 1 locations indicate that between 680Ma – 570Ma, these rocks were being erupted from a Uriconian volcanic oceanic island arc. Sitting off the north-west coast of Gondwanaland, the island arc resulted from one oceanic plate being subducted beneath another.

The Church Stretton Fault Complex developed around 600Ma as tectonic and volcanic activity continued. The Forest Glen and Quarry 1 basalt/dolerite dykes were intruded later, around 563Ma, and the Ercall Granophyre approximately 560Ma.

Between roughly 560Ma and 540Ma, late Precambrian/Early Cambrian tectonic movements caused folding and erosion of the earlier Precambrian highlands during an event known as the Cadomian Orogeny. Consequently, the highlands were eroded to a low-lying, arid landscape, devoid of vegetation and animal life. Conventional ideas suggest that in the early Cambrian, around 540 Ma, this denuded low-lying, Precambrian landscape was inundated by a shallow sea that gave rise to the conglomerate layers and ripples seen in the overlying Wrekin Quartzite Conglomerate.

View south from the Wrekin summit

However, David refutes the first part of this interpretation and argues that the nature of the conglomerate and quartzite beds suggests mass sediment movements during flash flood events. Rivers draining from the Precambrian highlands carried and disgorged sediment into low-lying ►

coastal lakes, (maybe wadis?) and lagoons. Each conglomersate bed represents a single mass sediment movement event deposited in hundreds of minutes or seconds. The finer bluish-grey shaley horizons, between, indicate quieter, low energy conditions where muds have settled out and matured over hundreds of years within standing water. There appears to be a lack of evidence for a marine origin, such as cross- bedding or marine fossils within these layers. The ripples seen on the quartzite beds, David attributes to wet, quicksand collapses slumping down shallow sloping surfaces into coastal wadis.

The conglomerate layer seen at the base of the Lower Comley Sandstone, is a disconformity representing 10 million years, when the underlying sheeted Wrekin Quartzite lay exposed to erosion. Later, tectonic forces caused eustatic sea level changes that resulted in deeper marine conditions developing, where finer and muddier sediment deposition resulted in forming the lower Comley Sandstone strata. Greenish glauconite within this stratum provides its colouration and indicates that water levels were less than 100m deep. Certainly, they were shallow enough for the world's first hard shelled organisms to live and thrive.

We finished our Ercall Quarry visit at the Quarry 3, Lower Comley Sandstone outcrop, as a heavy shower arrived at lunchtime. After lunch, a handful of us decided that we would walk up to the summit of the Wrekin. With the sun shining, we caught views across Shropshire and over towards Wales where the next showers loomed ready to drift our way. To the south-west, we could see the Long Mynd, Lawley and Caer Caradoc Hills marking the position of the Church Stretton Fault Zone which continues northwards, through the low-lying ground we saw towards us and west of the Wrekin.

With a quick coffee stop at the Halfway House on the way down, well timed to shelter from the rain, we reached the Forest Glen Car park at around 17.00 and headed home. I would like to thank David H Smith for a very rewarding day looking around this very interesting site, which, as David explained, is not fully understood and could do with further research to better understand it. ■

References:

• British Geological Survey map Sheet 152, 'Shrewsbury', 1:50,000 Scale, Solid and Drift, dated 1978.
• Shropshire Geological Society, Geotrail Leaflet, 'Around the Wrekin – From ashes to ice: making of Shropshire's favourite hill', dated 2007.

Andy Harrison

BCGS at the Perton Library Science Fair, Saturday 9 May 2026

Earlier this year we were approached by the Perton Library team for a 'display about glacial erratics' at the 2026 Perton Library Science Fair. This came about following the spreading of interest from the Birmingham Glacial Erratics project (rooted in the early Anglian ice advance) to the Wolverhampton area and the fine display of erratics from the most recent (Devensian) ice advance at Wightwick Manor. The BCGS field visit in February to ►

Glacial erratic boulder re-purposed as the Perton RAF War Memorial

Graham and Mike at the BCGS stand
Perton Library Science Fair

Wightwick Manor and the associated glacial erratic 'bouldery' at the Mount Hotel was the spark for this initiative.

It just so happens that Perton boasts its own very important glacial erratic. It was dug up during excavation of Perton's lakes in the 1970s. It weighs 6 tons and now forms the centre piece of an RAF war memorial – and there are many other erratics scattered around the area.

The Science Fair not only provided a showcase for the on-going glacial erratic investigations, but it gave us an excellent promotional opportunity for BCGS (*see front cover photo).* Our volunteer team assembled the display with just one allocated trestle table. The display board focussed on the 'erratic' theme but also highlighted our numerous recent activities, including field trips (both local and further afield), geoconservation work, and indoor talks, as well as providing a platform to promote the activities of the Black Country UNESCO Global Geopark. We are fortunate, at the moment, to have a wide range of geological leaflets to hand out and eye-catching exhibits to educate and amuse!

The event also hosted displays from the Lapworth Museum, an Astronomy section with two appropriately clad 'spacemen' to grab our attention, and activities outside included a racing car - popular with children to 'have a go' in the hot seat.

There was an excited buzz about the whole event. Our volunteers, Pete, Linda, Mike and Graham, did a great job and towards the end John and I arrived back from our very important event in London (see below) just in time for clearing up!

Pete, Mike and the 'spaceman' at the BCGS stand

We sincerely hope that we'll be invited back again next year. ■

Julie Schroder

Geologists' Association Awards for BCGS Members!

On 8th May BCGS members were honoured with two prestigious awards bestowed upon them by the Geologists' Association at a special event held at their headquarters, Burlington House in London.

Graham Hickman was the recipient of the President's Medal for his services to the GA and geology, especially during his 2 years as President of the GA. For BCGS, Graham's service goes back a lot ►

Graham Hickman receives the President's Medal from Liam Gallagher

further. As a student In the early days of BCGS Graham assisted enormously in the task of rescuing and recording Dudley Museum's geological collection from the dark, damp recesses of storage at the old Museum. In the late 1970s he went to study geology and physics at Leicester University, but never lost his ties with BCGS. He later took on the job of managing the BCGS website, but in 2012 - 2013 his work with BP took him away to Trinidad for a few years. Graham graciously passed on the website responsibility to John (who is still the webmaster) easing the transition with helpful hints and offering to maintain a geological advisory role as John felt rather under-qualified, being an amateur in the world of geology.

Graham has since supported the Society with Newsletter articles and talks, and has always been there, for the Society. We thank him for all he has done and congratulate him on receiving this well-deserved award.

It is awkward for me to announce the other award as the recipients were none other than your editorial team, Julie and John Schroder. We were both stunned to have been selected, jointly, for this year's Foulerton Award for our long service to BCGS 'communications', John particularly for his IT skills, and myself for 'skills in English writing' for editing the content of the Newsletter. BCGS is a GA Affiliated Society, and we are both also members of the GA. The main focus of the award is for the Newsletter, but it also includes the website and YouTube channel, both of which belong almost entirely to John's IT world.

Julie and John Schroder receive the Foulerton Award from retiring president, Liam Gallagher

In accepting the award we reflected on how inadequate we felt 17 years ago as amateur geologists taking on such a daunting task, and we particularly wanted to give our thanks to those who have supported us and contributed to the success of the Newsletter over the years. Firstly, our thanks go to the committee of the time and particularly Graham Worton for having faith in us, and for his constant and continuing support and encouragement. Then I must thank our wonderful contributors without whom there would be no Newsletter! Thanks go to Andy Harrison whose role as Field Secretary pre-dates our 20 year long membership of the Society. Andy provides us with detailed records of all the Society's field trips and geoconservation sessions, and these have become a mainstay of our Newsletter. Then there is the amazing world of Mike's Musings! For over 10 years Mike Allen has never failed to deliver – variously educating, ►

Commendation statement on view while Julie and John gave thanks for the award, acknowledging the rest of the BCGS team.

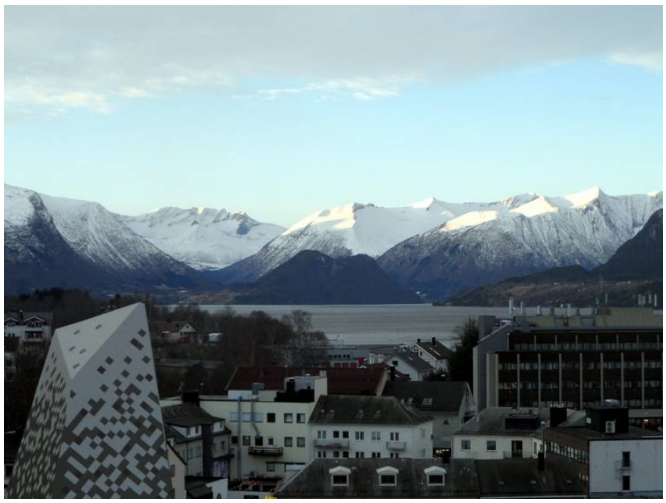
amusing and challenging us with his beautifully written and endlessly varied succession of geology-themed essays. More recently we are very grateful to Mike Williams for providing us with a seemingly never-ending succession of geological 'postcards' – short, snappy items featuring geological gems from all over the world.

There are many more and our thanks go to you all! We will treasure our award on a personal level, but also as an honour for all members of our wonderful society. We can't promise another 16 years, but we'll do our best to keep going for the foreseeable future. ■

Julie Schroder

Åndalsnes - Mountaineering capital of Norway

Åndalsnes is situated near the head of Romsdalsfjorden and the beginning of the Romsdalen valley, some 62.5° north. It is surrounded by magnificent mountain scenery carved from Precambrian gneiss and granite, and it is home to the 'Trollveggen' (Troll Wall), Europe's highest vertical rockface.



A view across rooftops of Åndalsnes and Romsdalsfjorden

The town location at the entrance to the Rauma river valley (Romsdalen) enabled transport links to be developed, particularly a rail-line. Today this is home to the Golden Train tourist attraction, voted Europe's most scenic train journey by the 'Lonely Planet' guide. During World War 2 this railway was instrumental in allowing the partial evacuation of Norway's gold reserve with some 200 crates containing approximately 9 tonnes, on board HMS Galatea in April 1940. The balance, approx 40 tonnes, was later successfully evacuated by HMS Enterprise and HMS Glasgow from locations further north.

Today, the railway offers spectacular views of mountain scenery as it ascends the Rauma Valley climbing 576 metres to reach the all year round resort of Bjorli. From here there is access to the high mountain region known as 'Nasjonalparkriket' (National Park Kingdom). The highlight of this journey is the transit past the Trollveggen (Troll Wall) a vertical rock face of 1000-1100 metres which at its steepest overhangs the base by 50 metres.

First climbed in 1965 by a Norwegian team just one day ahead of a British climbing party, the Trollveggen became a magnet for the world's best climbers with many routes established but subsequently modified due to rockfalls. It was first free climbed in 1979 and attempts are often recorded in weeks rather than days. The wall is not without tragedy as base jumping from its ridge summits became popular during the 1980s, resulting in the death of Carl Boenish the 'father' of base jumping which became illegal from the wall in 1986. ►

Trollveggen ('Troll Wall') in winter (Wikimedia Commons)

In geomorphological terms the Troll Wall is an enigma. One would expect that Romsdalen would be a U-shaped glacial valley but it doesn't fit the standard description. There is no sharp 'trough end' towards Bjorli or 'hanging valleys' along its length, and although modified by extensive rock falls the whole valley is a water eroded feature. This interpretation is confirmed by information boards provided at the viewing area in front of the wall which seem to indicate some form of river capture with a southward migrating watershed enabling the tributary rivers of Tverrelva/Ulvåa and Verma to run northward into the Rauma. This results in considerable enhancement to its erosive potential, hence the magnificent landscape we see today.

If you are a fan of the Norwegian author Jo Nesbo you may remember that Åndalsnes features in many of his Harry Hole novels as a place of escape from the chaotic lifestyle of the hero and to quote Harry's mother: "God started creating the world in Åndalsnes because the mountains are so beautiful there, spending so much time on it that the rest of the world had to be finished in a rush by Sunday". She may have just been right about that. ■

Mike Williams

More on 'Cannonball Limestones'...

Following from Mike's Musing 'More Spheroidal Objects' in the last Newsletter (No. 296, April 2026) it was a lovely surprise to receive some feedback from Jonathan Larwood, picking up on the passing mention of 'Cannonball Limestones' (NL 296, p.16). In Jonathan's words:

"Good to see more erratic visits going on and Mike's comprehensive consideration of nodules, concretions and all things oddly 'spherical'. I am very familiar with the cannonball limestone, I am from that neck of the woods and have grown up with amazing concretions..."

Small sample of 'Cannonball Limestone'

The photo shows a handy-sized specimen which lives on Jonathan's desk – surely the ultimate desk fidget toy! *Ed.* ■

Mike's Musings No. 63

Geology - 300 years old today?

My title this time around is a little tongue in cheek, and, of course, is timed to celebrate the 300th anniversary of the birth of a certain James Hutton; 'the founder of modern geology' ***(as Alan McKirdy's new biography puts it*** (Fig. 1)***, and which I acknowledge for much of the following detail)***. There will be many other events taking place this year to commemorate this august occasion.

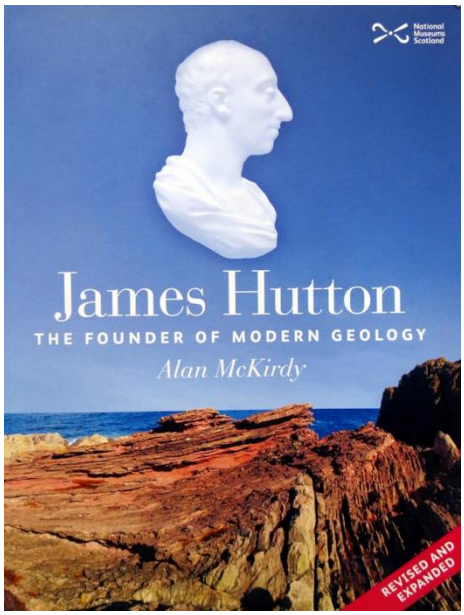


Fig. 1: Alan McKirdy's revised biography of James Hutton

Hutton (Fig. 2) came into this world on June 3rd 1726 (on the old style Julian calendar), one of five siblings born into a respected family of Edinburgh citizens. Unhappily, his father, a merchant who rose to the position of City Treasurer, died just three years later, so the principal influences on young James' upbringing were his mother and three sisters (his elder brother had died young before James was even born). However, the family were of sufficient means that there were no financial worries to concern him. This enabled him to focus on his intellectual pursuits in farming and geology, without the necessity to earn a living; a blessing, as it was to prove, to the wider development of geological science.

Fig. 2: Portrait of James Hutton by Henry Raeburn, 1776 (Wikimedia Commons)

His formal education was broad based, beginning at the High School of Edinburgh, where his interest in scientific matters emerged. He was sufficiently academic to attend lectures in Latin and the humanities (including logic, rhetoric and mathematics) at the university from 1740. He took up a legal apprenticeship in 1743, but found this achingly dull, so turned to medicine the following year, for which Edinburgh University had a high reputation. Medicine, however, was more of a cover for his greater interest in chemistry, also an emerging branch of science at the time (another celebrated name was to neglect his medical studies some 84 years later, before embarking upon a famous five year voyage aboard 'The Beagle')! Nevertheless, in 1747 he completed this course before pursuing further medical studies on the Continent, a common convention of the time.

Another incident in 1747 left a lasting effect on Hutton, namely the fathering of a child, also named James. Although little is known of the circumstances, it appears that he supported the mother and his son financially. What is more certain is that he never married, and apparently never had any further romantic entanglements. ►

Fig. 3: Slighhouses farm near Duns

Hutton spent two years in Paris continuing his medical education, and it was here that he probably attended the popular chemistry course conducted by Professor Rouelle, including lectures on mineralogy and geology, the first, and only, time he appears to have followed any formal geological training. He then moved on to Leiden University (another leading medical school), from which he graduated after fulfilling a doctoral thesis on the circulation of the blood in 1749. The notion of 'circulation' is echoed in his most important work some forty years later concerning the geological 'rock cycle', involving the formation, erosion and deposition of rocks through endless cycles of sedimentation, burial and uplift. It is tempting to imagine that his thesis provided in part the inspiration for his later work.

On his return to Britain he began to have doubts about medicine offering him a career path, so his thoughts turned once again to his favourite subject: chemistry. Teaming up with an old friend, James Davie, they saw a possible opening in the production of sal ammoniac, a commodity of use in dyeing and other industries, at that time available only as a naturally occurring substance from the Middle East. Their own experimentation demonstrated that it could be manufactured from soot, which was in plentiful supply as a waste product from the chimneys of 18th century 'Auld Reekie'. They also had the entrepreneurial skills to turn this idea into a successful business which earned them a considerable return for most of the rest of their lives. This enabled Hutton to build up a portfolio of wider business interests which gained him much kudos and respectability, as well as giving him the freedom to develop his intellectual ideas further.

Fig. 4: This drystone wall (or 'dyke') is part of the present-day boundary at Slighhouses farm

In 1752 he decided to travel again. Having inherited two Berwickshire farms he appears to have taken a deep interest in agriculture and land improvement (one is here reminded of the life of William Smith, 'The Father of Geology'), and set about visiting areas and people with similar interests at heart. Journeys by foot and on horseback (sometimes painful!) took him all over rural England and parts of the Low Countries across the Channel, where he was instructed in agricultural practice, soil and animal husbandry. Picking up on new technical innovations, in 1754 he set about applying them to his own contrasting lands at Slighhouses and Nether Monynut: at the time both were unkempt, stony, weed-ridden, poorly drained and very much neglected. Building drystone walls (known as 'dykes' in the Borders) was one of his early jobs on the farms. ►

Fig. 5: Information board near Hutton's upland farm

These days, Slighhouses (Figs. 3 & 4) is a thoroughly modern lowland farm celebrated for pork products and arable crops such as cereals and potatoes; Nether Monynut (Figs. 5 & 6) is a neat upland farm nestled on margin of the Lammermuir Hills specialising in sheep rearing and breeding.

Fig. 6: Nether Monynut farm near nowhere! (on the southern flank of the Lammermuir Hills)

Hutton spent the next 14 years toiling away, slowly improving the land applying the principles of crop rotation and more effective ploughing techniques. By experimenting with methods of improving soil fertility, and accumulating a wealth of information on the unhelpful Scottish climate, noting its effect on the crops he grew, his rigorous, scientific attention to detail paid dividends in improved yields. From this he concluded that crop quality was down to the climate, while crop quantity was down to soil fertility. This effort eventually fed into a paper on *The Theory of Rain* and an unpublished 150-page treatise, *Elements of Agriculture*.

Fig. 7: Slighhouses farm. Ditches like this were a source of inspiration and insight for Hutton!

Gradually his observations extended to the rocks and landscapes around him. He noticed how the drainage ditches he dug (Fig. 7) would slowly fill with sediment washed in by rains, and made the connection between this and rather more rapid examples of erosion at work on the East Anglian coast he had seen on his 'rural travels' (Fig. 8). One may presume that such observations, seeing the world with a 'geological eye', were the germ for his 'magnum opus'. Slowly, he was composing in his own mind the elements of his grand *Theory of the Earth.*

Fig. 8: looking towards Southwold: typical East Anglian scene of unstable cliffs

During his period of relative isolation on his farms, Hutton made one significant journey, in 1764, through the Highlands to Caithness, with 'geology' uppermost in his mind. Three years later, and with his farms in good order, he decided to move back to Edinburgh on a permanent basis in order to benefit from the better social opportunities this would provide. He moved into premises with his three sisters on St. John's Hill, over-looking Arthur's Seat and Salisbury Crag, where he would spend the remaining thirty years of his life. This proved a timely change, as the major Forth and Clyde canal project was in need of 'geological' expertise (once again the parallels with William Smith come to mind), and this offered a route back into the intellectual circles of Enlightenment Edinburgh. He invested both practically and financially in this enterprise, which was finally completed in 1790. ►

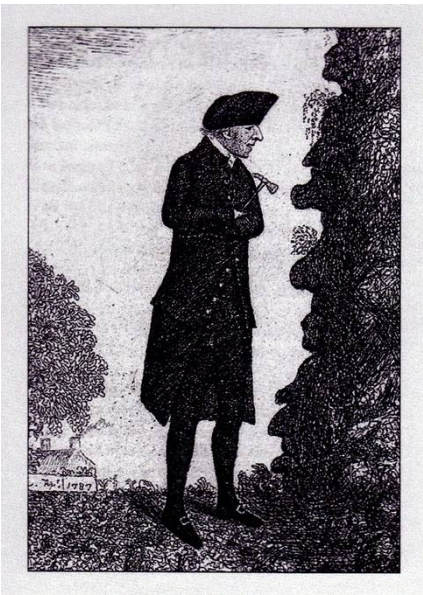


Fig. 9: 1787 caricature of Hutton by John Kay. The rock 'face' depicts contemporary commentators

Four letters that survive from around this period (c.1768-74) show the extent to which Hutton's geological understanding was taking shape. 1774 saw him off on his travels again, on this occasion accompanied by James Watt (one of the leading figures in Scottish Enlightenment circles), visiting Birmingham, the Cheshire salt mines and parts of mid-Wales. Back in Edinburgh he became fully integrated with the Enlightenment and was one of the first members of the newly established Philosophical Society, which was overtaken by the Royal Society of Edinburgh (receiving its Royal Charter in 1783). He sat on its first Council, alongside Joseph Black, Adam Smith and John Playfair. His confidence was clearly growing and he presented many papers on a widening range of subjects that included geology, agriculture and chemistry, of course, but also medicine, climate, philosophy, language and religion. Indeed, he was becoming a well respected polymath, in an age when such things were still possible!

Hutton also became acquainted with eminent men from the field of the arts, notably Walter Scott and Robert Burns, but the main focus remained on scientific pursuits, such as two presentations in 1784 on *The Theory of Rain*, no doubt drawing on data he had amassed during his 'farming period'. But it is for his rather grander *Theory of the Earth* for which Hutton is best known. John Playfair, his first biographer, suggests that Hutton first began to think seriously about geology at Slighhouses around 1755, and not until the 1760's did he start to develop his grand theory about the subject. However, it was not until 1785 that he formally presented his ideas to a wider audience (only published as a short *Abstract*). Like Darwin later on, he seemed in no hurry to publish, and was more disposed towards gathering evidence (Fig. 9). This he did with further field trips following his 1785 presentation, taking in many of the iconic locations now associated with his name.

Fig. 10: Injections of granite (pinkish) into host rocks (dark 'schistus'). Sample from Cheviot Granite similar to Hutton's in Glen Tilt:

Fig. 11: Graphic granite similar to an example Hutton commented on near Portsoy

First he visited Glen Tilt (1785), near Blair Atholl in Perthshire. Here he found evidence to support his view that granite began life in a molten state and was thus able to be intruded into the surrounding schists. He used the words 'introduced' and 'schistus' (Fig. 10). Figure 11 shows a sample of graphic granite similar to an example Hutton commented on near Portsay: such intergrowths of crystals, he reasoned, must be due to crystallisation from a molten state. This *Plutonist* view chimed with his idea of the Earth functioning as a ►

'heat engine', with the planet's internal heat providing a means of producing molten rock which could be injected into other pre-existing rocks. This went against the prevailing *Neptunist* ideas of the time (notably expounded on the continent by Abraham Werner at the mining academy in Saxony), which proposed that all rocks were formed in a primordial ocean, with granite being the oldest, underlying the sedimentary deposits produced by Noah's flood. In 1786 he found further such evidence amongst the granites of Galloway, as well as finding evidence for changes in sea level in the raised beaches along the Ayrshire coast. A trip to Arran in 1787 produced a geological sketch which reveals his understanding that large volumes of granite (Goat Fell) could be 'introduced' from depth. He also identified the first of three unconformities (Fig. 12), although he did not use this term but simply recognised the significance presented by two series of strata with sharply contrasting dispositions. That at Jedburgh (Fig. 13) was described later that year, with the most iconic example at Siccar Point (Figs. 14 & 15) following a boat trip in 1788.

Fig. 12: 'Hutton's unconformity' on Arran, near Lochranza. Now known to show Devonian red sandstones overlying Cambrian Dalradian schists

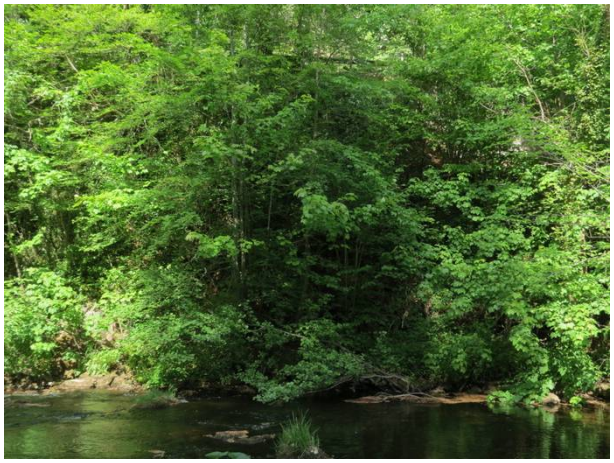


Fig. 13: Hutton's unconformity at Allar's Mill, on the banks of Jed Water, Jedburgh. This is the miserable view (for geologists) today!

Armed with these further observations in the field (his other insight was to recognise the importance of accurate field observations and deductions), he finally felt ready to go into print with *'Theory of the Earth; or an Investigation of the Laws observable in the Composition, Dissolution and Restoration of Land upon the Globe'.* It was published in the first volume of the Society's Transactions in 1788. This cumbersome title (commonplace for the time) was clarity personified in comparison with the turgid text, but all his insights are there to be read if you have the determination to plough through the convoluted style of his written word.

Hutton's principal visions lie in his exposition of what we would now describe as 'the rock cycle'; his appreciation of the heat of the planet's interior; the importance of soils; his notion that 'the present is the key to the past'; and finally his promulgation of what we now refer to as 'deep time' ("*no vestige of a beginning, no prospect of an end*"). He demonstrates his intelligence and perhaps a certain humility (he was obviously aware of his limitations) in refraining to put any figures to geological time spans – these would only come much later. ►

Fig. 14: Hutton's iconic unconformity at Siccar Point seen from the less familiar view looking west

Sadly, his health began to decline the following year (1789), limiting his field activities, but his final years (1792 -1797) saw an outpouring of his ideas in a series of books and further papers. These were committed to paper by hand, without the aid of modern technologies, in seemingly reduced circumstances from his modest premises overlooking Arthur's Seat, and this may have provided continued inspiration for the validity of his theories. Three substantial books on various philosophical subjects were published in 1792 and 1794 (collectively running to over 3,000 pages!). It appears not to be widely appreciated that this included an early draft of what would in time become the groundbreaking 'Theory of Evolution' of Darwin and Wallace, with the concept of natural selection forming part of his thinking. This may have been germinating through contact with Erasmus Darwin, who was known to hold ideas about 'survival of the fittest'. However, Hutton's convoluted prose did little to bring this element of his thinking to the fore, and it is not known whether Darwin was influenced by him in any way.

Fig. 15: Siccar Point unconformity seen from the more familiar side looking east (from an uncomfortably steep cliff-side perch!)

Meanwhile, the reaction to his 1788 *Theory of the Earth* paper was predictably negative, indeed hostile in some quarters, especially on the continent. Part of the criticism was theologically driven, with the argument over whether the Biblical notion of the Creation was to be taken literally, still colouring part of the scientific debate. Hutton's final act, more or less, was to respond to his critics with what he planned as a four volume 'improved' version of the *Theory of the Earth*. In the event only the first two volumes were published in his lifetime (in 1795). A third volume was left in manuscript form and had to wait for over a century before finally being seen into print in 1899. A fourth volume never materialised, pre-empted by his death in 1797.

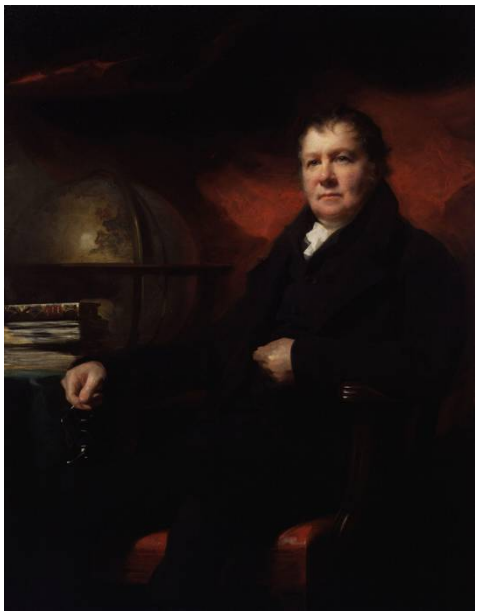


Fig. 16: John Playfair, Hutton's friend, champion and first biographer. Portrait by Sir Henry Raeburn

As is often the fate of great 'thinkers', their insights remain largely unappreciated during their lifetime. In 1802, his close friend, John Playfair (Fig. 16), published an informal biography, *Illustrations of the Huttonian Theory of the Earth*, which sought to popularise Hutton's work and present them in easier language. It has been suggested that without this they may have been lost forever (surely an exaggeration). Instead, we now recognise Hutton as the 'Founder of Modern Geology', a well-earned accolade for a life well lived. ■

Mike Allen