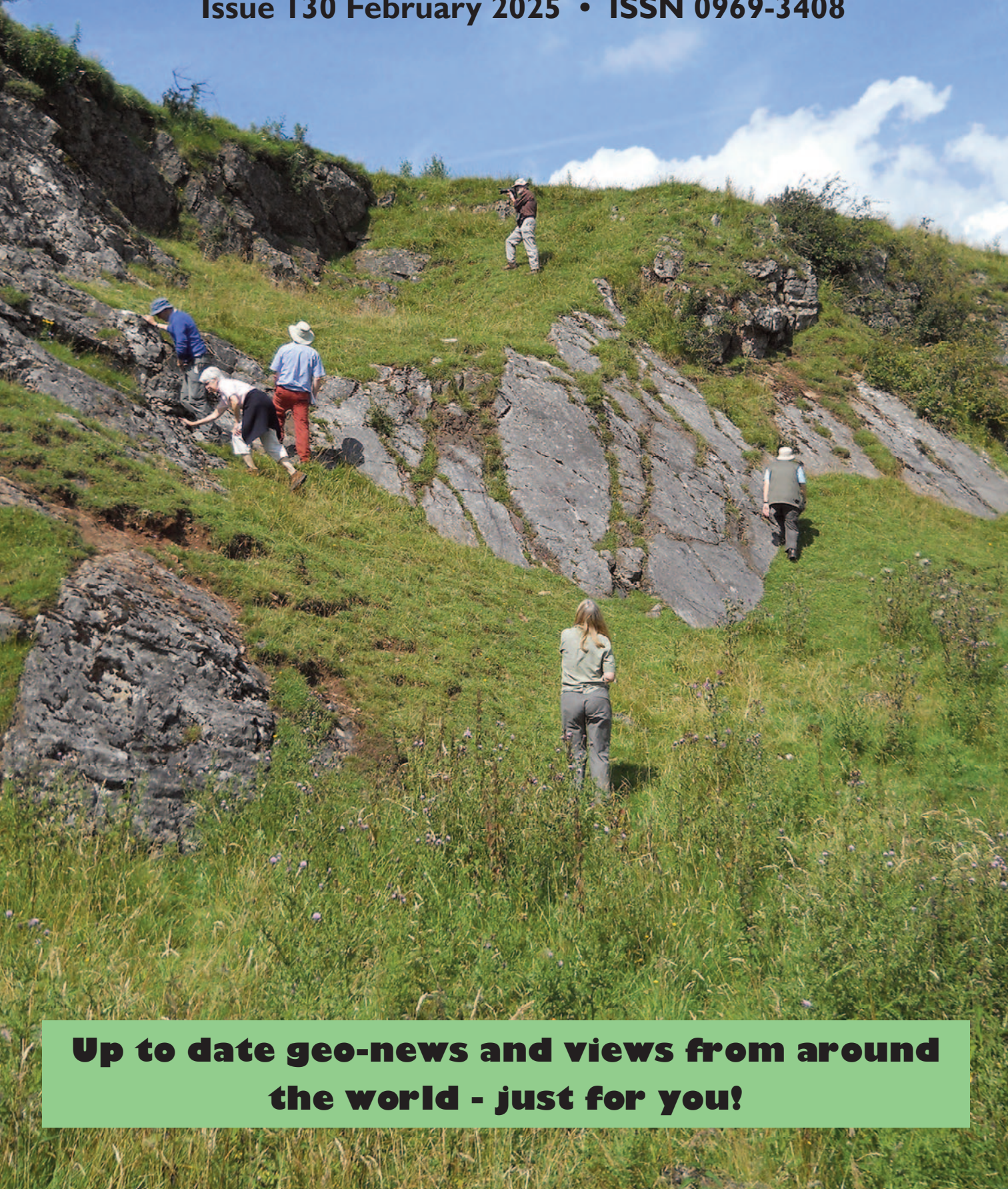




Down to Earth

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With the white buildings of Torquay in the background, this is the near vertical Devonian strata in the cliff. This location is known as London Bridge and will be seen on a boat cruise around the bay. (Image: Chris Darmon)

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cover story

*The Weaver Hills are an area of really
interesting geology around Ashbourne
in the Southwest of the Peak District.*

*They allow us an insight into deeper
water limestone facies of the Lower
Carboniferous. The rocks are steeply
dipping as shown here.*

(Image: Chris Darmon)



editorial

Science is being challenged as never before...

It would be easy, in the light of the recent election of President Donald J Trump in the US, to indulge in a blame game. But the rejection of climate science is far more complex than the actions of one man, whoever and wherever he is.

In many an Editorial in *Down to Earth*, I've banged on about the status and lack of influence that Earth Science is having. What we are seeing is yet another aspect of widespread ignorance of science in general and Earth Science in particular.

In a world where much of what we need or desire is available via our screen or device, why expend energy in engaging our brains with hard to understand concepts? In such a climate (sorry for the pun) it's hardly surprising that in a world where hard evidence is sometimes difficult to come by, that scepticism and downright denial thrive.

Whether we like it or not, many people live for the moment, the now, the next thrill or event. Things that may impact our Earth in the future are way beyond the horizon for such people. Rather than lambast such people we must engage with them. They ask for proof positive, we must bend over backwards to give it to them.

In a world where truth counts for little, or where parallel truths are available, we've got to strive to ensure that our truth conquers the narrative.

Rather than condemn social media we need to get in there with our own influencers to at least ensure that young people can hear our message loud and clear. That message must be clear and unambiguous and in language that ordinary people can understand.

Have you ever thought about the terminology that we use? Forget the man and woman in the street for a moment; even people within the geological community find it difficult to understand some of our terminology. And that's before you enter the world of acronyms!

Some of what is happening right now in some of the most advanced countries of the world, including our own, seems like it is a backward step. It feels like we are in some kind of pre-scientific world, where there isn't something called scientific proof. At the same time, those same people are agonising about the impacts AI is going to have on society. What a mess we appear to be in!

Pioneers of geology in the nineteenth and early twentieth centuries were looking at the Earth and seeking to find out how it worked. They looked for patterns on the Earth's surface and that's the thinking that brought us plate tectonics. When you look at how people were energised even forty years ago by such discoveries and compare it to the engagement with climate change now it does not bear comparison.

The big difference is that plate tectonics doesn't threaten human lifestyle or existence, whereas climate change does. We have a choice, either engage with our politicians and leaders worldwide and seek to influence their thinking or leave it to them, unchallenged.

Chris Darmon, Editor



New study sparks major rethink about the break up of the North Atlantic

Every now and again a study comes along that challenges conventional thinking in a dramatic way. It concerns the North Atlantic ocean and it suggests that far from there being two very separate continental plates, the North American and the Eurasian, there's actually only one!

It dares to suggest that whilst the continental plate has been severely stretched, it hasn't actually rifted. So, there are six continents and not seven. It drastically changes the percentage of the Earth's surface covered by continental crust with a consequent reduction in the percentage covered by oceanic crust.

If true, it would be the most dramatic discovery in a generation, challenging as it does, the conventional wisdom of the last 50 years. The paper's lead author is Dr Jordan Phethean of the University of Derby, along with a team from Uppsala University, Sweden and it appears in the journal *Gondwana Research*.



Derby University's Dr Jordan Phethean is one of the academics behind this new discovery. (Image: Derby University)

This comes from the University of Derby's website:

The incredible discovery was made by Dr Jordan Phethean, a lecturer in Earth Science at the University of Derby, as part of a wider team of scientists from universities in Southampton, Switzerland, Italy and the USA. The project was led by researcher Valentin Rime, who invited Dr Phethean to join the project due to his experience in Icelandic fieldwork and research.

The findings mean that, contrary to the traditional model for the formation of Iceland and the Greenland Iceland Faroes Ridge (GIFR), scientists now believe that the break-up of the European and North American continents is still ongoing.

Dr Phethean said: "The discovery indicates that the North American and Eurasian tectonic plates have not yet actually broken apart, as is traditionally thought to have happened 52 million years ago. They are, in fact, still stretching and in the process of breaking apart."

Controversially, this discovery sparks a debate over exactly how many continents officially exist in the world as, based on these findings,

scientifically speaking North America and Europe could be classed as one, not two. It also means that Iceland is now thought to be not just a volcanic island created by a hot mantle plume beneath, but that it also contains within it pieces of lost and submerged continental fragments buried beneath millions of years of volcanic lava flows.



Iceland's mid-ocean ridge becomes a line of tension rather than a plate break up. (Image: Visit Iceland)

"I like to think of this concept as the Earth Science equivalent of finding the Lost City of Atlantis; fragments of lost continent submerged beneath the sea and kilometres of lava flows. By studying the evolution of rifting in the volcanic Afra region of Africa and comparing this to the behaviour of the Earth in Iceland, we are able to see that these two regions are evolving in very similar ways." Dr Phethean said.

During their research, the scientists realised that Iceland and the Greenland Iceland Faroe Ridge is a newly-recognised type of feature, a Rifted Oceanic Magmatic Plateau, or ROMP for short. Their new concept of ROMP – a world-first – defines a newly recognised type of Earth feature that can better explain plate tectonic observations.

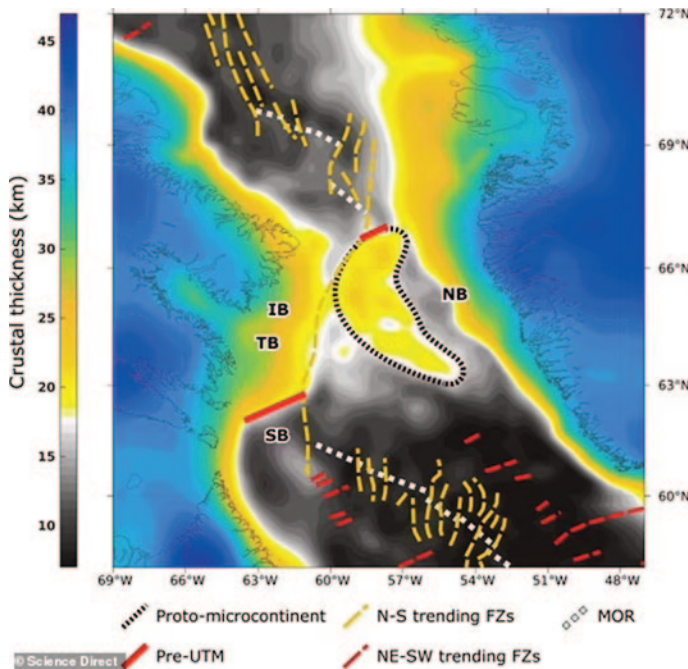
Dr Phethean added: "Our findings might also explain unusual indications of continental crust beneath Iceland and the GIFR, as seen from geochemical and geophysical experiments, and build on work and suggestions from other experts. While it is controversial to suggest that the GIFR contains a large amount of continental crust within it, and that the European and North American tectonic plates have perhaps not yet officially broken up, our findings suggest this is the case."

Dr Phethean will continue his work in Iceland by further investigating this concept by exploring the erupted volcanic rocks in Iceland for evidence of ancient continental crust brought up to the surface from beneath. The team are also undertaking plate tectonic modelling of the region and will undertake geodynamic computer simulations of continental breakup to try and model processes related to ROMP formation.

Meanwhile Dr Phethean, together with researcher Luke Longley from the University of Derby, were part of a team that recently discovered a new proto-microcontinent believed to have formed 60 million years ago. This proto-microcontinent is located between Canada and Greenland and is 250-miles long – about the same size as England. It

currently sits below the Davis Strait, which connects the Labrador Sea in the south with Baffin Bay to the north.

Its discovery was made using gravity data collected by space satellites and seismic reflection data - similar to a giant ultrasound scan of the Earth - which enabled the team to get an even better view of the proto-microcontinent.



The newly discovered micro-continent in the Davis Strait. (Image: Science Direct)

“Rifting and microcontinent formation are an ongoing phenomena,” said Dr Phethean, adding: “The discovery of the Davis Straight proto-microcontinent allows us to better understand the process by which microcontinents form, which in turn tells us more about how plate tectonics operates on Earth. This can allow scientists to better predict where useful resources might be found, how the Earth might look millions of years into the future, and how plate tectonics operated in Earth’s early history, as well as the role it might have played in the development of life.”

From September 2024, the University of Derby will offer a new BSc (Hons) Earth Sciences degree aimed at preparing students for a career creating a sustainable future for our planet and society. Dr Phethean said: “We are very excited about the Earth Sciences degree programme, which will give students the chance to be taught by members of our expert teaching team involved in a diverse range of research.”

The Editor comments: It’s too early to give any reaction to this discovery and the conclusions that have been drawn from it. It’s so radical, that there are bound to be a spectrum of views. For my part, it passes one test, that it helps explain at least one other recent discovery, the presence of Permian continental crust beneath parts of Iceland. We’ll endeavour to keep you informed as reaction comes in.

New York homeowner digs up mastodon in backyard...

A homeowner in Orange County in New York unearthed a complete mastodon jaw in his backyard, the first such find in more than 11 years.

NBC News reported:

The mastodon jaw, which was believed to be from an adult, was unearthed by researchers after the homeowner spotted it coming out from his lawn. The homeowner initially found two teeth hidden by a plant on the property, and after digging just a few inches underneath that, two more teeth were found.



The mastodon jaw being unearthed in the backyard of New York home owner. (Image: New York State Museum)

“When I found the teeth and examined them in my hands, I knew they

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were something special and decided to call in the experts,” the homeowner said.

Staff from the museum and university led excavation efforts after that, and uncovered the well-preserved jaw of the mastodon — an ancient relative of modern elephants. A piece of a toe bone and a rib fragment were found as well, officials said.

“While the jaw is the star of the show, the additional toe and rib fragments offer valuable context and the potential for additional research,” said Dr. Cory Harris, Chair of SUNY Orange’s Behavioural Sciences Department. “We are also hoping to further explore the immediate area to see if there are any additional bones that were preserved.”



How’s this for a fine set of teeth?
(Image: New York State Museum)

The fossils will undergo carbon dating and analysis in order to determine just how long ago the mammal was roaming the area, what the diet consisted of, and details of its habitat, according to officials, who noted that the discovery will be featured in public programming starting in 2025.

“This discovery is a testament to the rich paleontological history of New York and the ongoing efforts to understand its past,” said Dr. Robert Feranec, director of Research & Collections and curator of Ice Age Animals at the New York State Museum. “This mastodon jaw provides a unique opportunity to study the ecology of this magnificent species, which will enhance our understanding of the Ice Age ecosystems from this region.”

Oil giant Shell to join forces with Equinor in the North Sea...

With all that’s going on in the field of UK energy supplies right now it’s easy to lose track of the fact that the North Sea is still quite a major producer of oil and gas. The name of Royal Dutch Shell has been synonymous with the North Sea for some 50 years.

Now Shell has decided to join up with Equinor in a new joint venture that will combine their respective North Sea assets. This is normal when a field is coming towards the end of its natural life as the North Sea is. The new company will be based in Aberdeen.

Protests at Northern Ireland gold mine enquiry...

A public enquiry into plans for a controversial gold mine in Northern Ireland’s South Tyrone is taking place in Omagh. Outside are protesters from groups opposed to the plans by Dalradian Gold to develop a mine that they say be the largest single investment into the



Inside the Curraghinalt mine, where Dalradian have carried out significant work over the last 15 years.
(Image: Dalradian Gold)

Northern Ireland economy, which they estimate at £5bn. They also say it’s the biggest investment by a US owned company.

Dalradian Gold has been working on the Curraghinalt mine site near Greencastle in the Sperrin Mountains since 2009 with the aim of developing an underground mine. The mine is said to contain one of the world’s most significant undeveloped gold deposits as well as substantial quantities of silver, copper and other minerals. Over the past 15 years extensive underground work has been carried out and at least 10 veins have been discovered.



Is this what the Curraghinalt site might look like if the planning application for the gold mine is accepted? It’s certainly a rural scene at the moment.
(Image: Dalradian Gold)

Dalradian believes the site could yield 100 tonnes of gold, 48 tonnes of silver and 15,000 tonnes of copper in its 20 to 25-year lifetime. But the plans have been divisive, with some in local community welcoming the prospect of jobs and investment while others remain concerned about the impact on health and the environment.

The mine is located in an Area of Outstanding Natural Beauty, close to the Owenkillow and Owenreagh rivers which contain several protected species. Amongst the protesters are Friends of the Earth and the Save our Sperrins Group.

The public enquiry is expected to make its decision in the coming months. We’ll keep you informed.



The Great Sulphur Vein saga Part 2

We continue with Part 2 of Laurence's Heslop's piece of research into The Great Sulphur Vein of the North Pennine Orefield.

We pick up the story by repeating a bit of the Tectonic History and orefield origins - sorry it got cut off in mid-sentence...

Tectonic history and orefield origins

Geophysical work in 2018 offered supporting proof that the North Pennine Batholith was unlikely to be hot enough to create this thermal gradient also called 'the chimney effect'. Early this decade new scientific research by Dr. Eddie Dempsey and his colleagues opened up a new avenue which could prove to be the origin of the Alston Block's minerals. A key feature of this collective study are the four main orientations of the regional faults and fractures present within the Block's rock formations.

1. Cross Veins: NNW-SSE to NNE-SSW
2. Lead Veins: NE-SW
3. & 4. Quarter Point Veins: ENE-WSW and WNW-ESE

These are caused by four tectonic events from the early Carboniferous:-

- a) Thermal subsidence during the accumulation of sediments during the Carboniferous on the block and basin structure.
- b). The Variscan Orogeny (380 to 290 million years) across southern Europe had a 'far field' effect on Northern England in later Carboniferous times resulting in a north south crustal shortening powerful enough to reactivate old basement boundary faults including a deep-seated north/south trending east facing monocline, the Burtreeford Disturbance which almost bisects the Alston Block.
- c). Intrusion of the Whin Sill Complex, four separate sills were intruded over a six-million-year period from 300 mya caused by crustal extension of the lithosphere, magma and associated hydrothermal mineral rich fluids rose direct from the mantle through the roots of reactivated fault lines. Structural changes from the intrusion are thought likely to be responsible for the two sets of strike-slip faults, the cross veins and lead veins; they contain the majority of mineral veins.
- d) Towards the end of the Cretaceous and early Palaeogene a mantle plume close to present day Iceland initiated the opening of the North Atlantic causing an uplift of the North Pennines; again old fault systems were aggravated. This volcanic episode created many of the Scottish Inner Hebrides and produced dyke swarms, those originating from Mull spread south-east through Northern England. One of the most prominent dykes, Cleveland Dyke as mentioned, outcrops close to the GSV cutting through some mineral veins, dated 56 million years old, geochemical data confirms the source as Mull.

The strata of Northern England developed a marked eastern tilt whilst some Permian sediments were preserved by downfaulting, new data



A reminder of the location of Alston Moor in the regional context, as drawn by the author.

has shown an average of 4,500 feet of sediments were eroded. The relatively recent tectonic effects of the Miocene age Alpine Orogeny is thought to have prompted further uplift and erosion. While glacial erosion during the Quaternary brought more mineral veins of the North Pennine Orefield (NPO) nearer to the surface, increasing the chances that more oreshoots were removed. Post glacial meltwater discharges and isostatic adjustments put the finishing touches to the present topography. Distilling all the knowledge gained from these many decades of investigations and field studies, a two-phase origin of the NPO has been put forward.

Phase One belongs to the north-south crustal shortening during the late Carboniferous effects of the Variscan Orogeny. The boundary faults and regional lines of weakness were moved forming a set of conjugate faults the Cross Veins in which subsequent mineralisation was poor. The adjacent basins and troughs were uplifted, and Carboniferous sedimentation came to an end.

Phase Two was of greater significance; deformation was contemporary



The eastern end of the GSV in Darn Gill. The strata on the right slope of the valley is steeply dipping to the north opposed to the gentle northern dip of strata on the other side.

with the emplacement of the mantle derived Whin Sill which was driven by north-south extension of the crust. The associated east-west compression reactivated the Stublick-Ninety Fathom and Lunedale fault systems on the north and south boundaries respectively.

Within the block, the Lead veins and Quarter Point veins developed and were heavily mineralised by the rising fluids that radiated out. They interacted with the host rocks, enriching mineral veins and produced 'flats'. What the miners called 'flats' is the result of metasomatism, the replacing of large volumes of limestone strata with minerals of high quality and therefore of great economic consequence.

The discovery of a flat was considered a prestigious find and the hope of many a mining operation. During this phase the Burtreeford Disturbance was again reactivated by an east-west stress on this long monocline fold enabling it to act as a direct feeder channel for the whin sill magma.

Geochronological analysis on iron pyrites using rhenium-osmium dating was also of great importance, work using this method dated the sulphides to 294 million years old, this together with their slight radioactive signature adds support to the strong possibility of the source of the Whin Sill magma, direct from the mantle.

Similar studies of fluorspar samples support the pyrite's age and a connection to the same body of magma thus discounting the once strong possibility of the Zechstein Sea brines and the leaching of Carboniferous rocks as sources.

The Great Sulphur Vein (GSV)

This is a major Northern Pennine Orefield vein, long, wide and deep when compared to the NPO's other 339 veins. Striking roughly west to east it is one of the best examples of the Quarter Point group of veins. Structurally the GSV is a faulted northward-facing monocline, with a strong, shear belt in places. The downthrow averages 150 feet with a maximum of 600 feet at Cash Burn exposing the Whin Sill to form the impressive waterfall, Cash Force. Nearby, ribs of massive quartz jut out of the rough moorland vegetation. The vein's width also varies from 100 feet in the valley bottoms up to a maximum of 1,200 feet on the evocatively named hilltop of Noonstones.

The GSV is one of only two veins where silica is an important constituent, large scale silicification of the host limestone beds is the reason for such unusual widths. In the valley of Crossgill below the west slope of Noonstones, a bed of shale is silicified to form a limey-shale and unusually a bed of sandstone has also been replaced by silica.

For almost all its length, the GSV runs through the "fluorspar-zone". The NPO is one of the world's finest examples of a zoned orefield, fluorspar in the North Pennines occurs in several colours with purple dominating the colour range. Associated fluorescence is thought to be the result of small chalcopyrite (copper pyrites) concentrations and minute rare earth elements possibly indicating a centre of mineralisation.

The GSV carries large amounts of sulphides indicating a major fluorspar vein was removed, possibly, by the erosion during Tertiary uplift. The quantity at depth of iron sulphides, together with abundant quartz is indicative of a 'deep root zone' from where these and other rare minerals have emanated. However it did remain a disappointment to the local population that the perceived potential of this oreshoot during its long mining history was accorded minimal joy.



The GSV is exposed here crossing Cross Gill. Where iron sulphides are visible.

Walking The Great Sulphur Vein

Following the vein using surface features is an adventurous undertaking. Starting at Knapside Hill Mine, at an altitude of 2,100 feet on the edge of the spectacular western Pennine escarpment and overlooking the rich farmlands of the Permian/Triassic half-graben Eden Valley. Beyond, magnificent panoramic views extend across to the largely Palaeozoic Lake District and north-west over Solway's Iapetus Suture, it is possible to see over the Border into the 'Laurentian Terrane' of the Southern Uplands.

There is a dam at this mine and evidence of hushing, a bell pit, a mine shop and stone lined levels indicating the GSV has been excavated, spoil heaps yield limonite with malachite, quartz and a little iron-stained galena.

Continuing eastward to the head of Aglionby Beck where deposits of limonite were worked. In 1871, to aid removal, a 2-mile, horse-drawn, 24-inch, light iron tramway was built from Hartside summit, however the venture was not a success. Down the gentle valley side, along the line of the vein more exploratory levels and hushing during the 1800's revealed lead at Hard Rigg Edge Mine. Despite the amount of input at this exposed location deposits were soon worked out. An uncommon mineral in the NPO, pyromorphite (lead chlorophosphate) can be found on the spoil tip.

Continuing downhill, the Maiden Way is crossed (foundations of this Roman Road can be seen) before arriving at the complex of Smittergill Mine, this site has been landscaped and a gravel estate road runs through. Records indicate successful workings from the mid 1700's and at intervals until 1910 producing quartz, iron sulphides and carbonate minerals, other minerals found here are fluorspar, sphalerite and galena. It is thought the Rotherhope Vein junction with the GSV resulted in a combination of these minerals that does not occur at another mine on the Alston Block. Folklore may play a part.

Many years ago I remember a fine but lonely mountain ash on the site, a tree often planted by the miners outside their mines in the hope of discovering a rich vein and to instil confidence. (Hope appears often in place and mine names throughout the NPO, e.g. Killhope and Rookhope).

Descending to the Black Burn where the width of the GSV is at a minimum of 108 feet is the confluence with Cash Burn and the 50-foot Whin Sill waterfall of Cash Force. Following the burn upstream ribs of massive quartz protrude from the grassy north slope, nearer the old Cash Well mines, close the Pennine Way National Trail samples of fluorspar and marcasite (white iron pyrite) can be collected from well picked spoil heaps.

East of the Trail the GSV splits into two branches over Pikeman Hill and into Duffergill Burn. Here in 1939/40 a quarry for silica stone was opened by a quartz outcrop but owing to high transports costs and the mixed quality extraction was limited and the operation closed down. Further east, quartz crags are exposed before descending the steep east facing valley side of Cross Gill. In the vicinity there are the remains of mining activity spanning almost 150 years and here the vein's northern branch measures a width of 100 feet, with an east-west fracture containing an iron sulphide vein 6 to 11 feet wide.

Climbing up the western slopes of Noonstones on to the summit with a grand panoramic view there is an extensive quartz zone free from sulphides. Here quartz has replaced the Six Fathom Hazle beds, and the monocline is seen dipping 20 degrees to the north. By contrast, the eastern slopes of thick glacial drift deposits cover all possible



A boulder of iron sulphides and quartz detached and rolled from its source by swollen waters from the GSV upstream.

evidence of the GSV until reaching the river South Tyne and the Tynebottom Limestone where the north branch is partly exposed in the limestone with many small quartz-filled cracks.

Close by is Sir John's Mine whose north branch below is a shear zone of silicified shale; the south branch of replaced bedded limestone dipping 40 degrees north contains beside the ubiquitous quartz, galena, sphalerite and chalcocopyrite. The Whin Sill here directly underlies the metasomatized limestone resulting in a very complete replacement, of the original calcite less than 0.5% remains. The nearness of the Whin Sill is thought to have influenced one of the orefield's highest concentrations of silver in the lead ore. Forty ounces per ton.

Miners' hopes of discovering gold at this mine were sadly dashed. Over one hundred years after works began the mine was reopened in 1941 for the Non-Ferrous Ores Committee (Ministry of Supply) access to the GSV, small quantities of lead and copper were removed. It was thought at the time that there was more to be gained by mining deeper, however the existing economic conditions prevented any attempts.

Upstream the Whin Sill is exposed at the surface forming the first and only large waterfall on the River Tyne. A few hundred yards from the confluence of the nearby Clargill Burn quartz belonging to the GSV is exposed from where it continues eastward splitting into several divergent strings. By Dargill Bridge on the Alston to Langdon Beck road some strings are visible in the contorted strata. In this area the GSV lode fades away.

To the north, the west facing slopes of Windy Brow along the same contours display several mineral spoil heaps, on these examples of supergene malachite (copper carbonate) can occur. Samples formed by the same processes as those at Knapside Hill, they appropriately

bookend a traverse of the Great Sulphur Vein, bringing to an end this saga and all the uncertainties that may have eventually determined the genesis of the NPO. And in which the perceived wealth of the GSV left many involved deflated.

It is worth reflecting on the Alston Block's economic situation 80 years ago:- Dunham's detailed book, was based upon a government instruction to assess the NPO's economic potential. He concluded the GSV "probably contains a large tonnage of iron sulphides at or near the Tynebottom Limestone horizon particularly where it is underlain by the Whin Sill". In hindsight this is a notion which has been supported by the recent research into the mantle derived Whin Sill as possibly the principal material source of the North Pennine Orefield.

He goes on to comment that the quartz which constitutes up to half of the GSV ore dilutes its wealth especially in comparison to the massive sulphide deposits known abroad. However, from another point of view. If this area had been more intensively mined during the intervening years the present environment of wild, open, rolling

farmed moorland would have been so very different. Most definitely it would not be 'England's Last Wilderness' nor the landscape dear to Auden's heart as this paragraph from his poem 'Amor Loci' illustrates. 'I could draw its map by heart, showing its contours, strata and vegetation name every height, small burn and lonely shieling.'

Important footnote:

I am an enthusiast of geology in general, however for those specifically keen on mineralogy and mining history the GSV and its several hundred nearby veins in this outwardly bleak, desolate North Pennine upland is a rich and rewarding area to visit and explore.

Though please bear the following points in mind if visiting this area, whether it is familiar or unfamiliar, closely observe conditions related to the Weather, Topography, Countryside Code, Local By-Laws, Local People and your own level of fitness.

Lawrence Heslop, September 2024



rockstars

Another famous rock...

Box stone

Somehow I've managed to ignore the very existence of a fine Jurassic limestone which was quarried close to its eponymous village of Box in Wiltshire.

This comes from the website of Mindat, always a fount of geological knowledge:

Stretching between Box Hill and the end of Isambard Kingdom Brunel's Box railway tunnel, is the largest stone mine in Britain. Building stone had been quarried from Box Hill since medieval times using open pits (initially these were started during the Roman occupation of Britain), but the extent of the stone was unknown until Brunel built his tunnel through the hill, which was completed in 1841.



*Inside Box stone mine.
(Image: Wikipedia)*

During construction of the tunnel, as crews blasted their way through the hill, they became aware of the vast quantities of good quality Bath Stone (an oolitic limestone comprising granular fragments of calcium carbonate) which was ideal for use as building stone. Soon after building the tunnel several local companies started to mine the stone commercially; these companies were Pictors, Nobles, and Stones. Building stone output reached its peak in the 19th century and then steadily declined until 1968 when it ceased altogether. Many impressive features still exist inside the mine, including tools, work benches, cranes, wells, large timber supports, to name but a few.

Author: Chris Darmon

The mine areas evolved in a haphazard manner and passed over the top of Box Tunnel. Many of the workings ran in to each other underground causing the huge labyrinth of tunnels that have been left behind today. The total quarried area is approximately 2 miles long and 1 mile wide in an oval shape. The total passage length of Box is estimated at 15 miles, if not more. There were numerous air shafts leading up to the surface, but most have now been filled in. The quarry had a light rail system and a railway siding on the main Great Western Railway line at the Corsham end of the Box Tunnel.

Despite the site being designated as an SSSI, there is no access to Box Mine as the owners, Hanson U.K. have installed gates/grills on all entrances. According to Hanson, "There is no prospect of us entertaining access for anyone, I'm afraid. Nor should any experienced caver consider entering the mine... last year we ceased all underground inspections on safety grounds."

Luckily for us, there are some fascinating images from the underground mine on the internet. As for the stone itself, it lives on in building up and down the country from fine churches to stately homes and even railway stations. Consider what we would have lost if it wasn't for Isambard Kingdom Brunel!



The beautiful Box parish church with its fine Box Stone.



The oldest rocks in Britain, Northern Ireland & Ireland

For the last issue of Down to Earth our correspondent Paddy Gaffikin brought us a fine contribution on the megafauna of the Ice Age. This time he steps back, a very long way in geological time, to bring us the oldest rocks of these islands.

Over to you, Paddy...

'All nature is good'

St. Augustine of Hippo (354-430 AD).

How are the ages of rocks determined?

Many sedimentary rocks contain fossils, which can provide one way to enable the ages of such rocks to be determined. Indeed, it is the presence of distinctive fossils that was the basis for the establishment of the stratigraphic column, as we know it, with its eras and periods. However, fossils can only provide us with relative ages.

Igneous and metamorphic rocks contain small amounts of radioactive elements, known as isotopes, which can act like a 'clock' to give us their absolute ages, in millions of years. The latter is called radiometric dating and it is based on the radioactive element ('parent' element) decaying, over time, to a stable element ('daughter' element). In the process the radioactive element emits radiation.

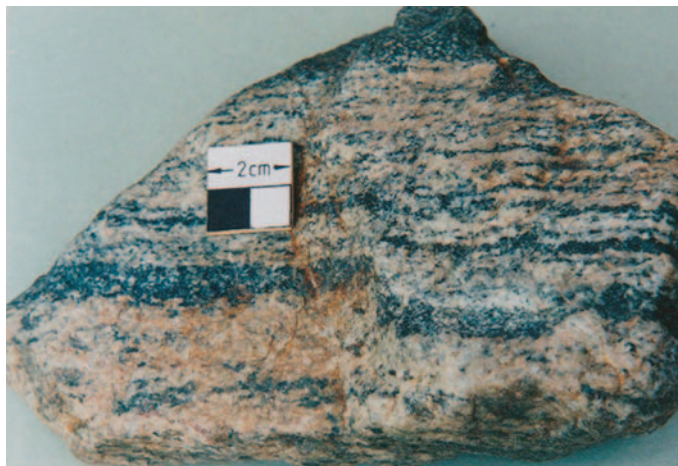
For instance an isotope of uranium decaying to lead. Radioactive elements can exist with two or more varieties of different atomic weights – these are called isotopes. Using a complex instrument, called a mass spectrometer, the amount of the 'parent' element and the 'daughter' element now present in the rock can be determined. By the use of a complex formula, knowing these amounts and the decay constant for the isotope, the age of the rock can be calculated. The decay constant is related to the 'half life' of the particular isotope of the element.

The 'half life' is the time it takes for half of the amount of 'parent' atoms to decay and it is used because the whole life of a radioactive element is infinite; that is, a radioactive substance never ceases to emit radiation. However, caution must be exercised when measuring the amount of 'daughter' element present because only the 'daughter' element should be measured and not an amount of this element in the original composition of the rock.

Rocks are millions of years old and so the 'half life' of the radioactive elements used to date them is in the order of millions of years. Organic material for example archaeological discoveries, on the other hand, uses radioactive carbon for dating because it has a 'half life' of many thousands of years.

The oldest rocks in Britain

The oldest rocks in Britain are around 3,000 million years old and they are gneisses found on the island of Lewis in north west Scotland



A sample of Lewisian Gneiss

and are called Lewisian Gneisses although they are not confined to the island of Lewis. They also outcrop in other places in north west Scotland like the islands Barra, Uist, Coll, Tiree and in parts of the mainland. The oldest Lewisian (on the mainland) has been dated at slightly more than 3 billion years.



Highly deformed Lewisian Gneiss at Sango Sands, Northwest Scotland (Image: Chris Darmon)

Gneiss is a very hard metamorphic rock, which often exhibits banding – the bands alternate between dark minerals like biotite mica and light-coloured minerals like feldspar and quartz. It is a high grade metamorphic rock because it formed by high pressure and high temperatures on an igneous rock such as granite although sedimentary rocks, like shale, can also be metamorphosed into gneiss. These rocks have a long history of being repeatedly metamorphosed over a period of more than 1 billion years.



A cut and polished sample of Lewisian Gneiss.

The oldest rocks in Northern Ireland

In Northern Ireland the oldest rocks are quartz schists of Dalradian age found in the Murlough Bay area of north east Co. Antrim. 'Dalradian' is a term only applicable to rocks in N. Ireland and Scotland and it represents rocks of Late Precambrian age (594-720 millions of years old). They are named after the ancient Kingdom of Dalriada where rocks of this age outcrop. Schist is a low-grade metamorphic rock formed by moderate temperature and pressure on sedimentary rocks such as mudstone or igneous rocks such as volcanic tuff. Mica minerals, such as muscovite, are common in schists.



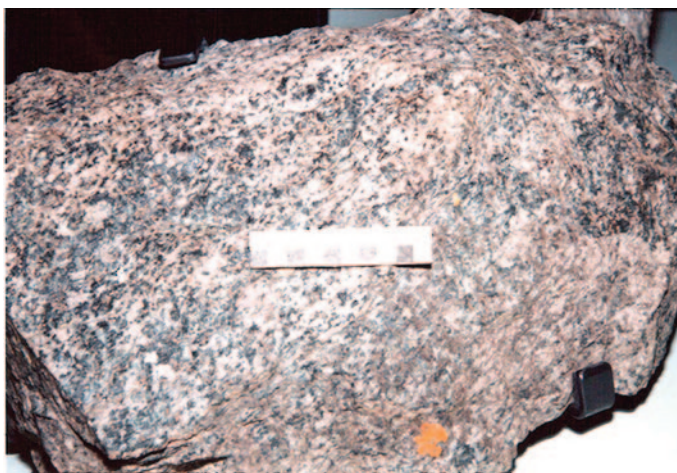
A sample of highly deformed schist in Northeast Co. Antrim. (Image: Dr. M. Cooper, Belfast.)



An outcrop of Dalradian schists in North East Co. Antrim. (Image: Dr. M. Cooper, Belfast.)

The oldest rocks in Ireland

The oldest rocks in Ireland occur on the island of Inishtrahull, an island off the north coast of Donegal. They are around 2,000 million



A specimen of Inishtrahull Gneiss. Photo taken of this rock on display in the Ulster Museum, Botanic Gardens, Belfast. (Scaler is 10cm long.)

years old and are the metamorphic rock, gneiss.

On mainland Ireland the oldest rocks are also gneisses but are a bit younger. They can be found at Cross Point on the Mullet Peninsula, Co Mayo. Like schist, gneiss is formed by regional metamorphism but the temperature and pressure involved to produce gneiss is greater than that for schist. It is a harder rock than schist and so is more resistant to weathering.



Gneiss on the Mullet Peninsula, Co. Mayo. (Image: Mr. P. Millar, Belfast Geologists' Society.)

The oldest rocks in the world

The Arcasta Gneisses, with an age around 4,000 million years, occur in the western Slave Province of northern Canada and are the oldest rocks in the world so far discovered. When these metamorphic rocks were forming there was no life on Earth.

In fact all of the rocks we see around us, no matter where we live, pre-date, by many millions of years, the emergence of modern humans. All rocks are indeed rocks of ages!

The Editor comments: Thanks Paddy for this lovely tour of the oldest rocks in these islands. We'll leave you our readers to find out the oldest rocks in England and Wales! When you have, why not come back to us with your comments and pictures?

Determination & perseverance of fish versus man

Richard Mann will be well known to many readers of Down to Earth as a regular contributor to our various brainteasers over the years.

This time he's been inspired to produce a contribution on a subject that grabbed his attention in South Africa...

Before reading what follows, imagine what conditions and mindsets were around at the times following the Boer Wars, The First World War and leading into the start of the Second World War in a developing country on the south coast of Africa as Apartheid arose.

Now transport yourself to the early 1970s where the coelacanth fish story started as a very primitive fish found in Lower Devonian strata (390 mya) which was described as becoming "extinct" about the same time as the dinosaurs c. 65 mya. Such was the situation until a single live dilapidated specimen was unexpectedly fished in offshore South Africa in December 1939 among a by-catch of sharks. This was a very exciting, unexpected and provocative find.

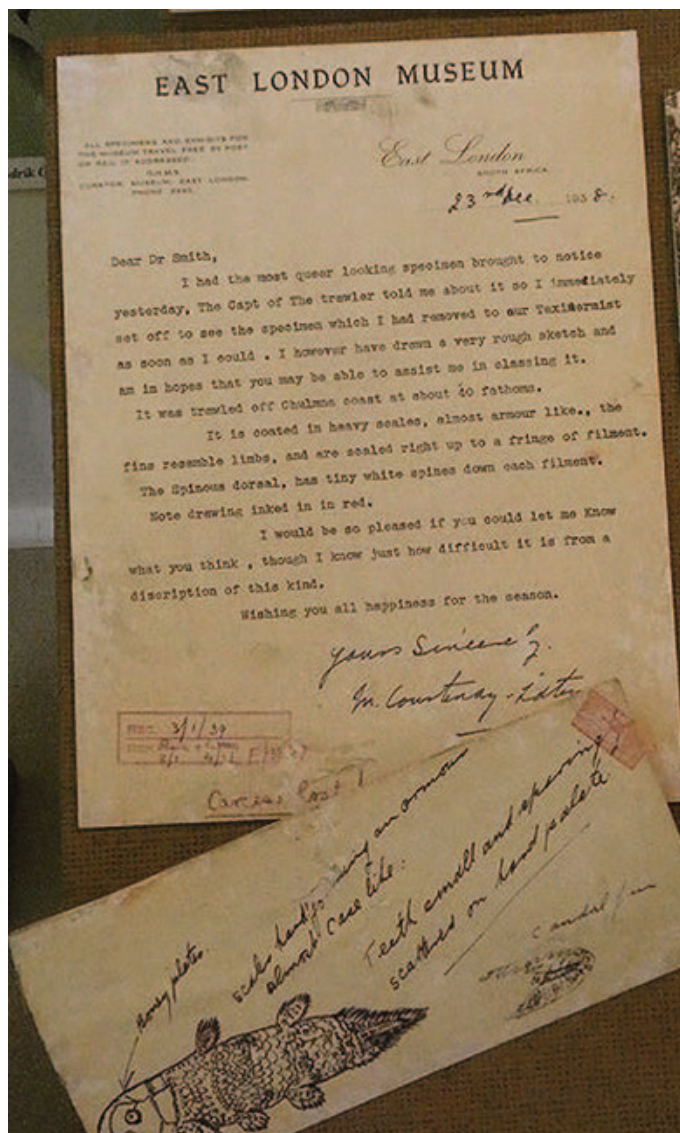
During a recent visit to the 'old jail' municipal Knysna Museum I happened upon a life sized display of a coelacanth together with original reports relating to this find, effectively 100 years after the first fossilised coelacanth was reported by the geologist, Agassiz in German Devonian strata.

Included below are extracts from the display, which brought further insight, together with the many trials and tribulations involved, so bringing the story to life. Revealing the need to search for more fish specimens enabling detailed scientific research and maybe put an end into the extinction mystery.

The first living specimen was found among a shark by-catch. The captain of the vessel, Captain Goosen, radio messaged his company to relay an important "never-seen-before fish" message to the curator of the local East London Museum. He later searched in the pile of fish and separated the unique bright blue with white mottling fish for inspection at the museum. Goosen recalled: "I lifted up its lip to look at its teeth and it snapped its jaw shut. It didn't like me opening its mouth".

On arriving in East London harbour he ordered as Irvin and Johnson clerk to telephone the 22-year old curator of the museum, Miss (later Dr.) Courtenay-Latimer to tell her about the fish catch for the museum.

Miss Courtenay-Latimer urgently wrote and posted the following letter to a known amateur ichthyologist Dr. JLB Smith of (Rhodes/Grahamstown University, Chemistry Dept), who was holidaying locally in Knysna. However he did not receive the letter until weeks later, and after the rotting fish had been disposed of. However, he had recognised the 'extinct' fish from the sketch of the specimen.



Miss Courtenay-Latimer's original letter to Dr. Smith and her sketch of the coelacanth.

refuse and was irretrievable, lost forever. Smith urgently wanted to study another coelacanth. He and his wife Margaret scoured the south eastern coast of Africa during four expeditions between 1946 and 1952. Numerous talks with fishermen gave no clues. He even prepared and distributed a leaflet around the fishing and boating community.

This leaflet showed how desperate the scientific community had become, with Smith offering approximately £8,400 per specimen, in today's money. In response to this, much later, a second fish was caught west of the Comoro Islands. Many communications were made and efforts were increased in order to carefully retrieve this specimen.



A copy of Smith's reward leaflet, aimed at getting himself a better specimen to study.

The story evolved following the involvement of the South African government allowing the use of a Dakota military aeroplane to transport the fish and Smith back to base for identification following very special permission to fly over Mozambican air space.

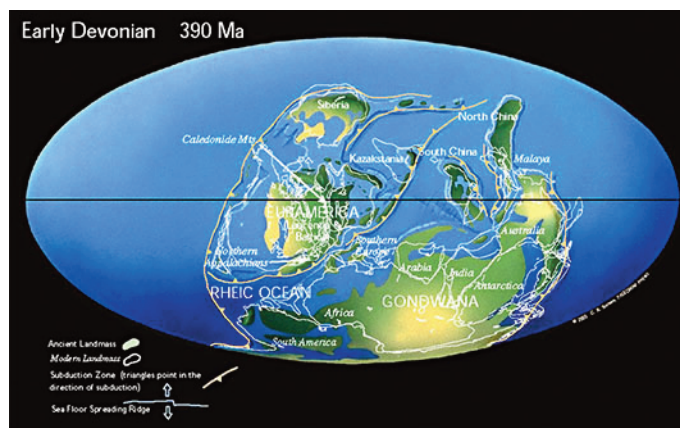
Between the late 1960s and 1970s deep sea remote operated vessels (JAGO ROV's) were deployed to locate the two possible fish habitats owing to it being too deep and impossible to reach by scuba diving techniques. This technological advance was owing to deep marine surveys progress (petroleum and geophysical mapping). The rest of the story continued with an emphasis on Fish Evolution and potential loss of these habitats and overfishing which could have led to real extinction.

Nowadays we have many other tools at hand to assist scientific projects yet there remains some doubt whether this fish provides a link with bony or cartilaginous fish evolution. The evolutionary history otherwise is more or less covered with finds now being more widespread in non marine and seawater habitats. This is probably closely linked to development of the marine tracts between the African, South American and Antarctic plates and more remotely in Western India during the progressive plate tectonic movements in and around Gondwana.



*A fine image of a coelacanth specimen that can be seen 'in the flesh' at The Natural History Museum in London.
(Image: Natural History Museum)*

Professor Scotese in the USA is well known for his reconstructions of the continents through geological time. Examination of such a reconstruction for the Lower Devonian shows the marine tracts discussed above.



*Palaogeography map for the Lower Devonian, from Scotese.
(Image: Courtesy of Scotese)*



The General Story - as told by Knysna Museum.

Richard Mann concludes:

I am especially grateful to the following in the compilation of this work. The original sponsors IJ Marine, Knysna Museum and several Scientific Institutions combined with the continued passion of all those involved in this the Coelacanth Story.



in-house

A look at some of the new and exciting happenings in the world of Down to Earth & Geo Supplies - by Chris Darmon

We've had to put up the prices of some of our books...

Last time we shared with you the fact that the prices of many books are increasing at a quite alarming rate.

Sometimes, this is because of change of owner as in the case of Dunedin Press, which has now been purchased by Liverpool Academic Press. Some titles in the former Dunedin stable have increased quite substantially.

We, along with everybody else, also have to factor in the recent and planned increases by Royal Mail. As always, we try to keep all increases to the absolute minimum, but we do have to ensure that we make a little on each sale!

At Geo Supplies we have no hidden extra charges and Royal Mail Second Class to anywhere in the UK is included in the prices.

*Why not check in advance to ask about a specific item?
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We nearly 'lost' the Rite in the Rain 540F...

We recently had an email from the European distributors who handle the US made *Rite in the Rain* field notebooks to tell us that a number of lines, including the specialist Geologists' Notebook, known to us as the 540F, was no longer going to be available.

We checked to see if this was a decision to drop the product by the manufacturer or the distributor. When we found out it was the latter, we ensured future supplies by placing a large order.

We have been assured that we will still be able to get them, but that there will be a price increase (the first for about 8 years) of roughly 20%. So, in the end, it's actually good news - the 540F lives on!



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Overseas guides...

We are asked, quite regularly, about availability of overseas geological guides, particularly those written in English. I'm afraid that, aside from the Terra Guides and those of the Geologists' Association, we are rarely able to oblige - sorry!

Down to Earth readers welcome!

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1/2025



If you haven't joined one of our residential field trips before, what can you expect?

- *Our residential field trips are suitable for adults of all levels of interest and geological knowledge.*
- *Our trips are friendly and informal and usually comprise 15-20 people. Overseas trips are usually larger.*
- *We usually make use of comfortable small hotels and guest houses and all meals are included.*
- *You have the services of Chris Darmon and Colin Schofield as field leaders. Both are highly experienced and knowledgeable field geologists.*
- *For some trips we have a hired minibus but on other trips we will use shared cars, or even public transport.*
- *Dates shown in this listing are the start and finish dates.*
- *Where prices are quoted, they are per person in a shared twin/double room.*

If you still have any questions or queries, don't hesitate to email us at: downtoearth@geosupplies.co.uk or tel: 0114 245 5746

Before you book one of our field trips...

We are always pleased to welcome new people along on our trips. So if you are thinking about it, what do you need to know before you 'take the plunge'?

Who are the trips aimed at?

The short answer is that they are not aimed at any particular group of people. Our participants are mainly older retired people who want to keep their minds and bodies active, but younger people are welcome.

Some people have lots of geological field experience whilst others are complete beginners. As one person put it to us "I've forgotten all I once knew and need to come along to hear it again." Our UK trips are all small groups of 15 to 20 people maximum so we can make lots of what we say personal to you.

Will I be able to manage the walking?

We always try to keep walking to a minimum, but, almost by definition, some walking will be involved. If you can't manage a particular walk, just tell us and it will never be a problem for you not to do it. We have one person who really enjoys sketching - she's done some amazing sketches while the rest of us visit a quarry!

How do we get about on trips?

It varies a lot from trip to trip. Sometimes we hire a minibus, on other occasions we use public transport and at other times we'll make use of shared cars. Look at the details for each trip to find out.

What about accommodation?

We always try to use hotels or guest houses that have ensuite rooms as standard. Most of our accommodation will provide breakfast and evening meals, but sometimes we eat in local restaurants. We include the cost of all food, including a packed lunch for each field day.

We prefer to use small family run hotels and guest houses but they are getting harder to find, so sometimes we use larger hotels such as Premier Inns and hotels in the Leisureplex group. Once again, see the individual trip brochures for details.

Are your bookings safe with us?

Yes indeed they are! We've been in the business of running trips a long time and ensure that all the money you pay us is safe in a client trust account until your trip is completed.

The 2025/6 programme...

We are delighted with the way that our 2025 programme has been received, with a number of trips now fully booked. Unfortunately we've been forced to cancel our September trip to Iceland because we are unable to get sufficient hotel beds at the required times.

We've now fixed Iceland for September 13-22 2026 and we've also taken our first look at the 2026 season - see later in this section.

To make a booking for any of the following trips email us at: downtoearth@geosupplies.co.uk or ring us on: 0114 245 5746 Whilst the brochures are, or will be, available on our website, booking forms are only available from us. You can then arrange to pay the deposit and we'll send you the booking form.

Isle of Arran, March 30-April 6

£1395

Welcome to the Isle of Arran that is the original geologists' paradise. James Hutton was probably the first person to study the geology of Arran in 1786 when he described an unconformity at Lochranza. Since then, thousands have trod the paths to examine the rocks! Arran is currently going down the path to become a full geopark.



Arran on a beautiful day showing the landscape and a magnificent raised beach. (Image: Scottish Geology Trust)

This trip is based at the very comfortable (and warm) Best Western Kinloch Hotel at Blackwaterfoot on the Island's quiet west coast. We spend a leisurely week examining most parts of Arran, making full use of unlimited travel on the local buses - the terminus of the main route is right outside our hotel.

We may be able to fit you in - contact us now!

NEW! Scarborough, on the Yorkshire Coast June 1-6 £895

Amazingly, we have never based a trip at Scarborough the 'queen' of the Yorkshire Coast, for the simple reason that we've never found suitable accommodation! Based at the comfortable Cumberland Hotel, we'll spend 5-nights in and around the town, taking in field visits to places like Filey, Forge Valley, Robin Hoods Bay and Whitby to mention just a few. This will allow us to examine rocks from the Jurassic and also the Cretaceous with lots of fossils and sedimentary structures that give us clues to ancient environments.

At the time of writing we have single and double rooms available.

Welcome to our real world!



The Cumberland Hotel in Scarborough. (Image: Leisureplex)

Western Lake District, June 25-30

£895

The Lake District is renowned for its superb landscape and scenery, but access to the central part is limited and accommodation is very expensive. We have previously stayed at Summergrove Halls in Whitehaven, but this is no longer available to us. Accordingly we've turned to Workington and the comfortable modern Premier Inn.



Amazing New Red Sandstone cliffs at St Bees. (Image: St Bees community)

From Workington we'll be able to access all of the Western Lakes, with trips to see places like Eskdale, Lake Windermere, the iron mines of West Cumbria and St Bees Head.

At the time of writing we still have room for a couple more people in twin/double rooms.

NEW! Heart of Wales. July 9-16

£1295

This is one of the most unusual offerings in our 2025 programme, for the simple reason that's an area that very few people know about. Mid-Wales, or as we prefer to call it, the Heart of Wales is a sparsely populated area set in the county of Powys.

We'll be based in the quirky Neuadd Arms in the quiet village of Llanwrtyd Wells, which offers excellent food, including an afternoon tea and cake, and even an on site brewery!

From here we'll explore the surrounding area, taking in Llandrindod Wells with its fossils, Builth Wells with its volcanic rocks, Llandeilo and its famous Ordovician rocks. We take in the local Elan Valley rocks and scenery, the minerals of Cwmystwyth and the fine cliffs of Aberystwyth.

At the time of writing we have vacancies for two more people.



The Neuadd Arms Hotel in Llanwrtyd Wells.

What is our Summer School?

Our Summer School is modelled on those that used to be run by the Open University a number of years ago. All are based on a campus of one sort or another where we can sleep in largely single, en-suite study bedrooms and enjoy on site meals. They are also more than just field trips with dedicated transport each day. There's an evening programme of talks from local experts and also social events. In short - something for everybody, including those with limited mobility!

Summer School Peak District, August 9-16

£1395

For the first time in the 7-year history of our Summer School weeks we're actually returning to a place that we've visited before. Cliff College in the Peak District of Derbyshire is a well known Methodist theological college. It provides excellent ensuite bedrooms and lovely home cooked food, and makes for an ideal summer school base.



The beautiful grounds of Cliff College (Image: Cliff College)

We'll be sampling lots of the excellent local geology and giving you those added summer school bonuses of evening talks and special visits to places of cultural and historic interest as well as geology.



Distinctive Red Permian rocks of South Devon

The South Devon Riviera coast has been a holiday destination for more than 150 years and we will be staying in the family run Hotel Balmoral in Torquay. From here we will be exploring the local area that lies within the UNESCO world geopark. This is an area of great coastal scenery, with lots of Devonian sediments, plus some volcanics. As the geology is best seen from the sea, we'll ensure that we have at least one boat trip out into Torbay to get up close and personal with the cliffs and their fabulous structures. We also hope to take a trip on the Paignton and Kingswear steam railway and combine it with another boat trip on the River Dart at Totnes.

Don't miss out on an Autumn break - come and join us in sunny Torquay!

2026

Iceland - the North & East Fjords, September 13-22 £2695

Get in now, to secure your place in September 2026 after we were forced to cancel our previously advertised trip.



*The Eastern Fjords are beautiful in any season!
(Image: Chris Darmon)*

These days a lot of people go to Iceland, but they very rarely visit the north and east of country. In this trip with our usual guide and driver Ingi, we'll begin at Keflavik near the airport and then travel to Akureyri before working our way clockwise to Myvatn to the volcano Krafla before heading to the beautiful east Fjords.

We'll stop in the amazing geo-village of Borgarfjarðar Eystri to see Iceland's most colourful rhyolitic rocks. The last time we were here we did see the Northern Lights in all their glory!

We travel back from Hofn to Keflavik completing our circuit of Iceland. There's an option of an additional night at the end to have a day looking at the most recent volcanic activity on the Reykjanes peninsula and viewing the recent lavas, which will still be hot!

Book before June 30th 2025 and you pay less - the 2025 price!

Other trips planned for 2026

We are currently working on our programme for 2026 and hope to include some, or all of the following:

The Northwest Highlands of Scotland
Central Cornwall
The Shetland Islands
The Isle of Anglesey
The Jurassic Coast
Pembrokeshire
The North Pennines

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We deliver online education that's enjoyable and stimulating whilst at the same time being informative and educational. No one is required to carry out any sort of assessment and there's no entry requirements or formalities. Just sign up and go!

The Wednesday club...

Join us on a live Zoom session each Wednesday for an hour, either at 2pm or 7pm - the choice is yours! Each topic comes with background written material and, if you are unable to join us live, you can even access a recording of the session, via our online learning platform Moodle.

February 5	Portland limestone - the Cenotaph rock
February 12	Roderick Murchison - pioneer geologist
February 26	Radiometric dating as applied to rocks
March 5	The Permian/Triassic extinction event
March 12	Millclose - a Derbyshire lead mine
March 19	Hard rock aggregates in the UK
March 26	UK marbles - the genuine and the look alike!

Cost: Individual talks £10.00 or £15.00 for 2 people, or take the final five sessions for £40.00 or £55.00 for 2 people.

*To register interest, email us at:
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Head to Oxfordshire for an amazing dinosaur 'super highway'...

It has been described as Britain's 'dinosaur highway' - hundreds of dinosaur footprints have been uncovered in an Oxfordshire limestone quarry.

The Jurassic footprints, the largest such find ever recorded in the UK were uncovered by a team of scientists from the Universities of Oxford and Birmingham. They cover an enormous expanse of quarry floor and are from at least two different dinosaurs, allowing researchers to sequence the events and work out what was going on, over perhaps several days or weeks around 180 Ma.

The excavation was filmed by BBC TV and was broadcast on BBC Two's *'Digging for Britain'* - if you missed it, you can catch it on the i-player. It also features in a special exhibition *'Breaking Ground'* at Oxford University's Museum of Natural History.

This is what Oxford's Museum of Natural History had to say:

The dig, carried out at Dewars Farm Quarry in Oxfordshire, uncovered five extensive trackways with evidence of more in the surrounding area. The longest continuous trackway measured more than 150 metres in length.

Four of the trackways were made by gigantic, long-necked, herbivorous dinosaurs called sauropods, most likely to be *Cetiosaurus*, an up to 18-metre-long cousin of the well-known *Diplodocus*. The fifth trackway was made by the carnivorous theropod dinosaur, *Megalosaurus* which had distinctive, large, three-toed feet with claws. One area of the site shows the carnivore and herbivore tracks crossing over, raising questions about whether and how the two were interacting.



*An artist's painted reconstruction of a Megalosaurus and a Cetiosaurus walking in a prehistoric landscape.
(Image: Courtesy of Mark Witton)*

Megalosaurus was the first dinosaur worldwide to be scientifically named and described in 1824, and kick-started the last 200 years of dinosaur science. The new trackways add to the significance of the area, and even though the discoveries are separated by just thirty years, modern techniques and technology mean the prints can be recorded much more comprehensively than ever before.

Prof. Richard Butler, Professor of Palaeobiology at the University of Birmingham, said: "There is much more that we can learn from this site, which is an important part of our national Earth heritage. Our 3D models will allow researchers to continue to study and make accessible this fascinating piece of our past for generations to come."

During the new excavation, more than 20,000 images were created of the prints. These will provide a wealth of material for further study and education and could yield valuable insights into how these dinosaurs walked, including speeds, how large they were, and if and how they interacted.



*These two images give an impression of both the size of the excavation and also the number of people involved in the work.
(Image: Emma Nicholls, Oxford University Museum of Natural History)*

Dr Duncan Murdock, Earth Scientist at OUMNH, said:
"The preservation is so detailed that we can see how the mud was deformed as the dinosaur's feet squelched in and out. Along with other fossils like burrows, shells and plants we can bring to life the muddy lagoon environment the dinosaurs walked through."



*Fine Megalosaurus footprints uncovered in the quarry.
(Image: Caroline Wood OUMNH)*

Dr Emma Nicholls, Vertebrate Palaeontologist at OUMNH explained:
"Scientists have known about and been studying Megalosaurus for longer than any other dinosaur on Earth, and yet these recent discoveries prove there is still new evidence of these animals out there, waiting to be found."

The footprints were buried under mud but came to light when quarry worker Gary Johnson felt 'unusual bumps' as he was stripping the clay back with his vehicle, in order to expose the quarry floor. At this point, the experts were called in. Working closely with Dewars Farm and Duns Tew Quarry Manager Mark Stanway, and his staff, the Universities of Oxford and Birmingham co-led a team of more than 100 people on a week-long excavation in June 2024. Together, they painstakingly uncovered around 200 footprints and built detailed 3D models of the site using aerial drone photography – documenting the footprints in unprecedented detail for future research.

Prof. Kirsty Edgar, Professor of Micropalaeontology at the University of Birmingham, said: "These footprints offer an extraordinary window into the lives of dinosaurs, revealing details about their movements, interactions, and the tropical environment they inhabited."

The Editor comments: Wow! If you get to see the '*Breaking Ground*' at OUMNH, tell us about it.

A former South Yorkshire coal mine site could become a limestone quarry...

Maltby colliery in South Yorkshire was a member of the elite league of coal mines as one that produced more than a million tonnes in a single year. Indeed it managed that feat by the mid-1930s.

Upon nationalisation of the mines in 1947, Maltby became a pit that was invested in, with modern equipment being provided. It was part of the Yorkshire Concealed Coalfield, with younger Permian strata overlying the Coal Measures of the Carboniferous. The pit finally closed in 2013, and the surface buildings were swept away.

It remains in the ownership of Hargreaves, who were the last people to operate the pit. Since then, the large site has remained in its abandoned state with several applications to reclaim it being turned down by the local authority. The latest scheme, which is expected to



This is the site of Maltby Colliery, no surprise that the latest plans will take nine years to complete.

(Image: Rotherham Business News)

take nine years to complete, sees part of the site being converted to extract 3.9 million tonnes of high quality dolomite from the Permian.

As part of the plans for the 42 acres site, natural habitats would be restored and recreational zones would be established. At the same time, 2.6 million tonnes of fill, including soil-making materials, would be brought to the site to help reshape and reclaim it. To allay the fears of local residents of excess lorry movements, the developers propose using the local railway line to transport much of the material in and out of the site. Even so, it could mean in excess of 100 lorry movements per day at periods during the project term.

Given the history of previous plans being put forward for this site and then being rejected by Rotherham Council, it will be interesting to see what happens with this latest one.

How long has your geological society been established?

So far this year, we've heard of two significant anniversaries that are due to happen during 2025. The Black Country Geological Society has been flourishing for 50 years whilst the Manchester Geologists' Association will be celebrating its centenary.

Whilst it's great that two of our well known and highly respected geology groups have reached these milestones, it would be even better to be able to report the establishments of a couple of brand new geology groups!

Congratulations to both the Black Country and Manchester - and keep up the good work!

Cliffe Hill Quarry gets permission to expand...

Midland Quarry Products Ltd has obtained permission from Leicestershire County Council to greatly expand its operations at Cliffe Hill Quarry Stanton under Bardon.

The Company currently works a Precambrian igneous complex for roadstone aggregate, close to the M1 motorway and a freight railway line. The new permission will release around 30 million tonnes of new reserves and keep the quarry in operation until 2042.

With this latest announcement, the supply of hard rock aggregates, especially for London and the Southeast, looks secure in the short and medium term.

Stegosaur bone returns home to Swindon after more than 150 years...

In 1874 significant parts of a stegosaur were discovered in a former brick pit in Swindon. Since then these have been on display at The Natural History Museum in London. Now one of the vertebrae has been returned to its home town and is on display in the town's museum.

This comes from Swindon Borough Council:

The original fossil remains were found in the clay pits of Swindon Brick and Tile Company in 1874, a site now occupied by Halford's and The Range in Fleming Way and the green space at Spring Gardens. The large fossil remains were sent to Richard Owen, director of the Natural History Museum, for identification. It was the first stegosaur ever named and described by scientists.



This is the stegosaur vertebra that has returned home to Swindon after 150 years. (Image: Swindon Borough Council)

While the greatest part of the Swindon Stegosaur remains in London and can be found on display in the Natural History Museum, other smaller parts were taken away by private fossil hunters and dispersed into other collections.

This new artefact for Museum & Art Swindon is a vertebra, advertised as coming from the same location in Swindon. It was found for sale online by local fossil hunters Dr Neville and Sally Hollingworth. Sally and Neville have been working alongside volunteers and staff at Museum & Art Swindon on identifying parts of the museum's fossil collection through the Arts Council England-funded '**Unlocking Collections**' project, and alerted staff to the fossil.

The pair said: "We saw this specimen for sale and realised its importance straight away. When the Swindon Stegosaur was collected in the 19th Century some of the original material ended up in private collections and we instantly recognised that the vertebra offered for sale had come from the original site where the skeleton was found. We're delighted that Museum & Art Swindon has put this truly unique find from the town on display and, hopefully, this will help raise awareness about the town's Jurassic past."

Councillor Marina Strinkovsky, Swindon Borough Council's Cabinet Member for Placemaking and Planning, said: "Swindon was really important in the history of palaeontology and loads of important fossil hunters lived here or visited Swindon in the late 19th Century to look for specimens. The stegosaur ignites the imagination of Swindonians of all ages, and it's fantastic that a piece of it is coming home."

If this is a fossil, it's a very old one...

Down to Earth reader **Margaret Ridley** recently moved from Ely to Church Stretton in Shropshire, where she lives within the valley formed by the Church Stretton Fault Complex.

She lives on the late Pre Cambrian Stretton Shales. For many years it was considered that rocks this old did not contain fossils. But we now know this isn't true with many finds in rocks as old, or even older than the Stretton Shales.



It may well be that the circular depressions are a strange sedimentary structure, but Margaret would love to know what it is. Can anyone help?

The Saltern Cove fossil tree...



One of the world's oldest tree fossils had been discovered in Saltern Cove near Paignton in the English Riviera Global Geopark. Dated at approximately 377 Ma, it was discovered by Dr Kevin Page during a condition survey of the Geopark's SSSI sites. They appear to be pieces of root and bark belonging to primitive lycopods. They provide us with a glimpse of what Torbay was like at this time in the Devonian.

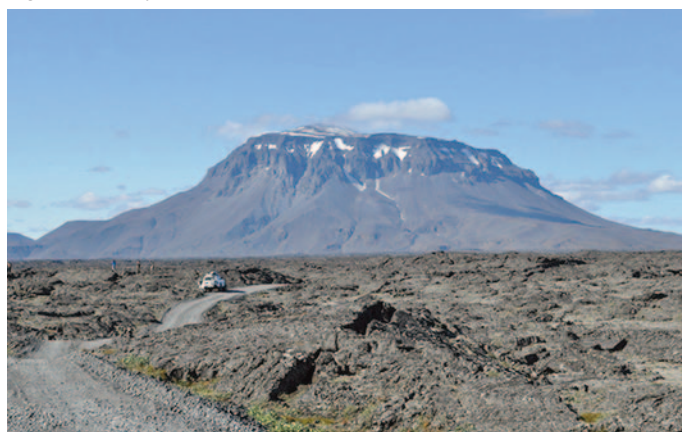
Volcanic Experiences 2025



Stromboli in eruption before dusk, as seen from viewpoint alongside the Sciara del Fuoco

Alan Clewlow has been arranging “*Volcanic Experiences*” escorted group tours to volcanically active areas of the world for over 25 years. These tours are open to all adults but offer particular interest to members of local geology societies and those with some knowledge of geology. Get the chance to see recently formed rocks and features and for some of the tours, the possibility of viewing an erupting volcano.

One of their most popular tours is the visit in June, to Sicily, and the Aeolian Islands ~ a cluster of volcanic islands lying to the north of Sicily. The tour takes in three active volcanoes ~ Etna, Vulcano and Stromboli. Mount Etna is Europe’s highest and most active volcano, having erupted regularly in recent years with frequent lava flows. The visit to Vulcano gives the opportunity to climb to the crater rim to see hissing sulphurous steam vents and to bathe in hot springs and bubbling mudpools. The highlight of the one-week tour for many is probably the visit to Stromboli. This island has been called “the Lighthouse of the Mediterranean” since Roman times. Its volcano sends out an explosive burst of lava into the atmosphere every few minutes. It’s best seen from a viewpoint alongside the Sciara del Fuoco (“slope of fire”), after following a low-level walk from Stromboli town. The tour offers a full programme of guided excursions with direct flights between London and Sicily, and good quality accommodation, having 5 nights based on the island of Lipari and 2 nights on Sicily.



The classic Icelandic table mountain Herðubreið (“Queen of the Mountains”), as seen on the route to Askja

Iceland in September...

The tour in early September focuses on the active north of Iceland. After spending the first evening in Reykjavik, the group heads north. After an overnight stop at Sauðarkrokur on the north coast, the group then makes for Myvatn, the base for the next four nights. Over the following days they explore a range of volcanic and landscape features around Myvatn itself and in the surrounding area, including Krafla (the site of the “Krafla Fires” of the 1970s), the huge waterfall at Dettifoss (Europe’s largest waterfall), the Tjornes peninsula, the giant canyon at Asbergi and Hverfjall (“crater mountain”), though the highlight for many will be the excursion by 4W/D bus into the remote wild interior to the dramatic caldera at Askja. In addition to the above, the trip offers the opportunity to take part in a whale-watching excursion from Husavik. After a final night of the tour in Reykjavik, there is a free morning in the city before the return flight to the UK.

In addition to two described the above, there are also tours to Santorini in May (now fully booked), and to La Palma in the Canary Islands in late November.

To find out more about all the 2025 tours, including a full day-by-day account of each itinerary, accommodation and travel arrangements go to the Volcanic Experiences website at:
www.volcanicexperiences.co.uk

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Hello Chris

Musk Ox

To add to Patrick Gaffikin's article (*DtoE 129*) on "The Megafauna of the Ice Age" an often missed out survivor of the ice ages is the Musk Ox, living in the Arctic areas of Canada, Alaska, Greenland and Russia. The name derives from the strong smell of the males during the rut which, after battling with each other for dominance of a female herd, is supposed to attract the females!



How to draw a Musk Ox - image from YouTube.

They stand up to 5 feet tall and can weigh up to 800lbs. Males and females have curved horns and both have thick shaggy coats for protection from the cold winters. Herds form a protective circle around the calves with their heads and horns facing outwards when faced with predators such as wolves and bears.

Pamela Boulton

Dear Chris

Ross of Mull Granite

I'm writing in response to the item Rockstars - Ross of Mull granite, in *Down to Earth 129*.

Between 1871 and 1905, the operators of the Shap granite pink quarry held a lease for the quarrying of Ross of Mull granite at Tormore, on the Isle of Mull, though the stone was not worked continuously. Stone was shipped to Silloth on the south Solway coast, then sent on by rail to the Shap works for processing.

So when visiting Westmorland and adjacent areas, it's always worth checking buildings, drinking fountains, etc. that contain pink granite, to see whether or not it's Ross of Mull. Polished Shap granite is easy to identify, of course, but Ross of Mull is easily confused with Peterhead pink granite. But that's another story.

Geoff Brambles

After we published a couple of letters about the origin of the famous Altar I expected that there would be further response. This was especially because they expressed opposing views. I'm delighted that Brian Ellis, who's something of an authority on the Quaternary, has penned this...

Hi Chris

Stonehenge's Altar Stone debate (DtoE 128/9)

The proposed link between the Stonehenge Altar Stone and Orkney generated a vigorous correspondence in the November issue of *DtoE*. This may be because it relied on criticism of the press reports rather than addressing the actual science involved.

The fact is that the proposal published in *Nature* reports geological research, specifically a very detailed petrological analysis of the Altar sandstone. I am not qualified to comment on the analytical techniques used.

However the results fulfil the most basic requirement of demonstrating the Altar sandstone most closely matches petrologically those outcropping in Orkney than any other ORS source in Britain. One can also measure the validity of the research by the facts that it is published in *Nature*, an internationally highly regarded and very selective science journal and that the work will have been subject to peer review. The article is available on line at:

www.nature.com/articles/s41586-024-07652-1.

It is worth pointing out that nearly all the article is geological.

There are real problems in using glaciation and the transport of an erratic as an explanation. Large sandstone erratics are rare as it disintegrates relatively easily. We have locally in Warwickshire a very hard Cambrian sandstone (formerly called a quartzite) and even so, it rarely survives in local tills more than brick size, travelling just a few kilometres.

An erratic could only have got so far south during the Anglian Ice advance. It is difficult to conceive of a sandstone block surviving 700+km intact (and unmarked?) a 700+km journey on or in the ice in that advance, particularly bearing in mind the complexities of the mechanics of glacier flow. The authors of the *Nature* article point out that [there are no] 'Scottish glacial erratics found at Stonehenge' or indeed in the area. They dismiss a glacial explanation and opt for the human one.

Peter Christie's contribution in *DtoE129* summarises the essence of that and it is dealt with in some detail in the *Nature* article.

Brian Ellis

The Editor comments: Thank you for this contribution Brian. I must confess to relying on the press reporting rather than the original article in *Nature* that would have surely satisfied me, as does your summary.

I guess that we now have to put the ball firmly in the court of the archaeologists for some meat on the bones of transport. Warning - curved ball coming - is water transport an option for much of the way?



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In this new brainteaser, we ask the Question...

Who, What & Where?



Thanks for the excellent response to our little brainteaser this issue. I'm pleased to say that everyone was right (even though we tried our hardest to put you off with the cartoon portrait!) You would have been correct if you thought the following:

What? The picture shows the famous section through the Ordovician and into the Silurian.

Where? Dob's Linn, Moffat in Scotland

Who? Professor Charles Lapworth

You also did not fail to satisfy me with your little anecdotes that make this quiz so interesting - here are a few of your comments.

Ray Starkey provided us with this reply: The place is Dob's Linn, which reputedly takes its name from Halbert Dobson, a 17th-century

Covenanter who hid from government troops here during a period of conflict in Scottish history known as 'The Killing Time'. It is well known as an internationally important geological site and is famous for its fossil graptolites. Which were studied in 1864 by the then amateur geologist Charles Lapworth (later Prof. Charles Lapworth) after whom the Lapworth Museum of Geology is named.

Thanks for the information about 'Dob's', I've often wondered what the origin was - Editor.

Julia Madelin said: Dob's Linn in the Southern Uplands of Scotland. Charles Lapworth, eventually professor of Geology at the University of Birmingham. Born 1842 died 1920. A pioneer of faunal analysis and was instrumental in sorting out the Ordovician period. I've never been there but it is a very interesting area, vaguely remember that the overlapping folds in the rock strata proved the crumple zone in plate tectonics.

You are indeed correct Julia about the 'crumple zone' also known as an accretionary prism! - Editor.

Peter Eyles said: This is classic graptolite locality. It supposedly shows a condensed sequence in a near-vertical series of shales from Upper Ordovician to Silurian, with graptolite faunas. The sequence is found in the gully below the waterfall.

For years I took my A level geologists on our way to Arran. There are lots of graptolites in the scree but in practice it is hard to find them in situ, as no hammering is allowed. You can just about make out a sequence with biserial types in the rocks downstream and monograptids upstream. Some nice *Rastrites* to be found. It is possible to show "way-up" using the fossils in situ. There is also faulting and folding in much-the-same lithology, so it is not easy! Lapworth used this locality and others to demonstrate zone fossils in a condensed sequence and very different rates of sedimentation in the Lower Palaeozoic in the Southern Uplands.

So what was Sedgwick's legacy? To start with he gave us 'The Sedgwick Club' the oldest student run geological society, set up at Cambridge in 1880 in his honour. His memorial at Cambridge was the new and enlarged museum that we see today.

We also had contributions from Peter Webb, Geoff Brambles and a longer piece from Brian Ellis, which we hope to include later.

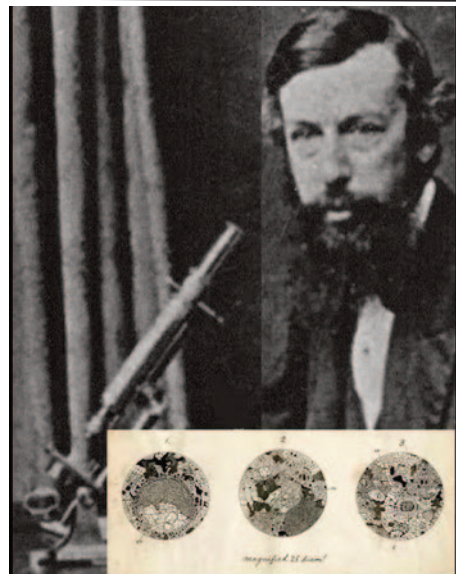
Our new brainteaser - it's not a competition with prizes! We'd like you to study these images and answer the Question: Who, What & Where?

An unusual one this time. Who was he, what's he known for and where is he most associated with?

Please contact us before April 15th.

by email:

downtoearth@geosupplies.co.uk



A letter from Ethiopia...

Martin Talbot is taking part in our online 'Geology of the British Isles' course and for several weeks he joined us from Ethiopia via Zoom. By way of a 'thank you' for our course, he agreed to send us this letter from Ethiopia...



The Adigrat sandstone in Tigray, into which the UNESCO-listed churches are cut.

The Barberton Greenstone Belt in South Africa was the starting point for my geological journey (if you don't count a childhood in the Old Red Sandstone of Pembrokeshire). Its astonishing 37km geo-trail takes you from outcrops of komatiite over 3 billion years old (in the place where komatiite got its name) up through a sequence that includes a banded iron formation representing oxygenation on a global scale and much else, up to early Archean pillow lavas at the top!

Back then I received from your online shop an invaluable hand lens, delivered to us in Maputo, Mozambique (next door to Barberton) and a stack of little white collection boxes, now full of samples from all over Africa (Namibian landforms are also something to behold. Since then I've had a series of jobs (as far removed from geology as one can imagine) that took me by car, foot, kayak, yacht and Cessna up the coast and interior of East Africa. We have seen much of the Mozambique Belt of sutures between the cratons of East Africa and many parts of the Rift Valley all the way to the Red Sea.

In these years I've enjoyed at least two 3-way Rift junctions and the Ol Doinyo Lengai volcano with its famously fluid carbonatitic lava in the Rift and the very oldest and the very youngest rocks in Africa (the youngest being not more than a week old, inside the caldera of the very active Erta Ale in the sub-sea-level Afar/Danakil Depression of Ethiopia.

We are coming to the end of our expatriate geology-rich years but are not finished with Ethiopia yet. Besides the Danakil - perhaps the most famous geological destination here - we have managed to sample three of the four compass points of the country where Precambrian basement metamorphic rocks are exposed (the same old Mozambique Belt and the Arabian-Nubian Shield), the landscape of Tigray pock-marked with trachyte plugs like a teenager's face and explored inside rock-cut churches of unknown antiquity carved out of both tuff (Lalibela) and sandstone.

Up there in Tigray I made the most charming discovery of all in this personal geological study-journey: at the bottom of the sandstone sequence from which the most literally dizzying church was cut I picked up glacial deposits from the 430 Ma Gondwana glaciation that we are now studying as the flash-cooling event that cycled sea levels in the Welsh Basin. Nothing of the wonders that we have seen in the rocks of Africa reminded me more of home than when I understood this link to the Silurian rocks near my parents' cottage back in Pembrokeshire!

My all-time favourite 'collections' are two-fold: a series of photos of bolide craters from different parts of Africa that I've been lucky enough to see from the air (in those countries where I could validate my PPL) including the colossal remains of the oldest visible, many tens of Km wide, south of Johannesburg, and a pair of rocks of matching size and weight from 120m below sea level on the old Red Sea floor in 45C heat in Afar - one is pure white coral, soft textured and representing life sprung from geology and returning to geology, the other a sharp-edge scoria, blacker than night, found on the sand less than a stone's throw from the coral, product of the extrusions that killed the sea here and all the coral that lived in it.

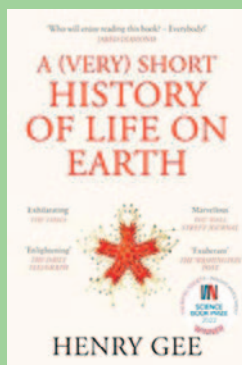


Pilot's-eye view inside the 2Ga, 190km Vredefort Dome impact crater, South Africa.



Book Choice

Title: A very short history of life on Earth
 Author: Henry Gee
 Publisher: Picador
 ISBN: 978 1 5290 6058 4
 Format: Softback
 Cost: £9.99
 Level: Adult & general interest
 My rating: *****



There used to be one name that you would readily associate with authoritative, yet highly readable books, on aspects of palaeontology and that was Richard Fortey. His use of the English language meant that it was always advisable to have a copy of the dictionary to hand for the odd (non palaeontological) word he would slip in from time to time! In some ways, this book by Henry Gee, senior editor at the journal *Nature*, reminds me of Richard and how he tackled similar huge topics.

The story of life on Earth stretches back a very long time and Henry begins his journey with the birth of our planet some 4.6 billion years ago. In order to cover, as he puts it, 4.6 billion years in just 12 Chapters, you have to take a very broad brush stroke approach. As a result, out go some of those palaeontological niceties and a lot of the strange language that palaeontologists tend to use. Instead, you're in for an exhilarating journey as you whizz through time.

With books like *In search of deep time* and *The Science of Middle Earth*, Henry Gee has form when it comes to writing on sweeping topics like this and he goes at it with the enthusiasm and flair that we've come to expect.

I almost dare not tell you too much for want of being accused of spoiling the plot! So I won't - instead I'll take you straight to the Epilogue, which is a nod to what us humans are doing to the Earth right now and crucially what might happen in the future. My eyes were drawn to some words relating to climate change and our response to slogans such as: Save the planet!

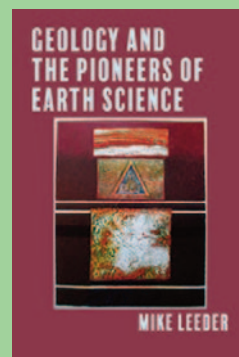
He says "It's tempting to retort: Stop plate tectonics! or even Stop plate tectonics now! After all, the Earth had been in existence for 4.6 billion years before *Homo sapiens* turned up, and will still be her long after *Homo sapiens* has gone."

This book does not pull its punches, the problems we face are laid bare, but crucially they are put into perspective. Life has faced far bigger challenges in the geological past and come through it, stronger and better than before. After all we are the ultimate product of evolution over those unimaginatively long periods of geological time.

He ends on a positive note: "Therefore, do not despair. The Earth abides, and life is living yet."

This isn't a book with lots of illustrations, just a clutch of time lines here and there. That said, there's nothing to distract you from the written word. I promise you that you will enjoy this book very much!

Title: Geology and the pioneers of Earth Science
 Author: Mike Leeder
 Publisher: Liverpool University Press
 ISBN: 978 1 78046 106 9
 Format: Hardback
 Cost: £49.95
 Level: Geological & scientific interest
 My rating: ****



For a science that has time at the very heart of its being, geology has a number of illustrious pioneers. Some, such as William Smith are almost universally recognised and celebrated, whilst others such as Arthur Holmes seem to have less recognition and we find names from mainland Europe or America being substituted instead.

Mike Leeder's fascinating book is an attempt to pick up on the time, after the likes of Sedgwick, Murchison and Smith who were the pioneers of geology. Instead he focuses on those scientists of the late nineteenth and the early twentieth century who were the pioneers of Earth Science.

He chooses a topic based approach which results in a total of six subject areas: deep stuff, drifting stuff, hot stuff, stressful stuff, climate stuff and finally: coda, legacies and connections. In each area he looks at the story that was inherited from the early pioneers and then where the 'new pioneers' took it to.

Within each topic there will be people whose names trip off the tongue like Beno Gutenberg, Alfred Wegener and Arthur Holmes, but also people less well known to us here in the UK like Inge Lehmann, Ernest Anderson and Karl Terzaghi.

He gives appropriate space to outline the work and achievements of each of the chosen scientists using a mix of historic black and white images, some showing them in their laboratories and modern diagrams and photographs in full colour.

The final part brings the strands of the previous parts together into what we now recognise as Earth Science. Once again, he uses a topic based approach: Mohos exposed; slip-sliding away; unzipping the oceans; carbon, mountains and cooling; isotopes, ice and orbits.

This book shows how a relatively small band of highly talented and innovative people often working under less than ideal conditions brought us a respected new subject area Earth Science. It grew out of geology and yet is still a part of geology. This book provides so much

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diary of events

lectures/zoom meetings

February

2 "Geological drugs and prophylactics - a look at the historical uses of fossils, minerals and rocks in the prevention an treatment of disease" by Chris Duffin
Organiser: Geologists' Association
Details: <https://geologistsassociation.org.uk/lectures/>

3 "The caves and karst of North Greenland" by Paul Smith
Organiser: Reading Geol. Soc. Details: rgs.secretary@btinternet.com

4 "Non-metals and metalloids - native elements" by Alistair Rickards
Organiser: Essex Rock & Min. Soc. Details: <http://www.erms.org/> (Shenfield)

4 "Deep sea canyons" by Kostas Kirlakoulakis
Organiser: Liverpool Geol. Soc. Details: lgsecretary19@gmail.com

5 "Stones and bones: Gideon Mantell's many finds and the stories they could tell of Sussex long ago" by Debby Matthews
Organiser: Brighton & Hove Geol. Soc. Details: <https://www.bhgs.org>

6 "Species loss, community collapse and ecosystem recovery during times of mass extinction" by Alex Dunhill
Organiser: Geol. Soc of Glasgow. Details: <https://geologyglasgow.org.uk/>

7 "Updating the geological map of the Yorkshire Wolds chalk aquifer" by Laura Sydes & Laura Garcia (Zoom) Organiser: Geologists' Association
Details: <https://geologistsassociation.org.uk/lectures/>

8 "Geothermal energy" by Ian Stimpson
Organiser: East Midlands Geol. Soc. Details: emgs.org.uk

8 "Palaeontology to Palaeobiology" - various speakers
Organiser: North Eastern Geol. Soc. Details: <https://www.negs.org.uk/>

10 "Railway Quaternary geology" by Sebastian Gibson
Organiser: Cambs. Geol. Soc. Details: <http://www.cambsgeology.org/events>

10 "Marine incursions in the Millstone Grit" by Phil Robinson
Details: <https://www.huddersfieldgeology.org.uk/talks/>

11 "Rise and fall of a Lake District Wolfram mine" by Chris Darmon (Zoom)
Organiser: Amateur Geol. Soc. Details: www.amgeosoc.wordpress.com

11 "The geology of Oman" by James Cresswell
Organiser: West of England GA Details: <https://www.wega.org.uk/>

12 "The 1831 Darwin-Sedgwick tour of North Wales" by Michael Roberts
Organiser: Shropshire Geol. Soc. Details: www.shropshiregeology.org.uk

12 "Geothermal energy" by Chris Rochelle
Organiser: Leicester Lit. & Phil. Soc. Details: <https://www.charnia.org.uk/>

12 "An update on geological investigations to underpin development of the UK GDF" by David Schofield (Zoom) Organiser: Cumberland Geol. Soc.
Details: <https://www.cumberland-geol-soc.org.uk/events/>

12 "The wonders of sedimentology" by Jon Noad (Zoom)
Organiser: Harrow & Hillingdon Geol. Soc. Details: <https://www.hhgs.org.uk/>

12 "Geological storage of hydrogen for net zero" by Katriona Edlmann
Organiser: Edinburgh Geol. Soc. Details: <https://www.edinburghgeolsoc.org/>

13 "The mineralogy of art" by Chris Duffin
Organiser: Mole Valley Geological Society. Details: www.mvgs.org.uk

13 "Economic geology" by Klara Brooksby
Organiser: Geol. Soc of Glasgow. Details: <https://geologyglasgow.org.uk/>

13 "Scotland's greatest Ice Age" by Ian Fairchild
Organiser: Hertfordshire Geol. Soc. Details: <https://www.hertsgeolsoc.org.uk/>

14 "Exploring Antarctica's buried landscapes" by Stewart Jamieson (Zoom)
Organiser: North Eastern Geol. Soc. Details: <https://www.negs.org.uk>

14 "Fossil viruses and the role of viruses in Earth science" by Maurice Tucker
Organiser: Farnham Geol. Soc. Details: <https://www.farnhamgeosoc.org.uk/>

15 "The letters of William Smith" by Kevin Privett
Organiser: South Wales GA Details: <http://swga.org.uk/>

17 "The Wuda Flora: an earliest Permian tropical forest ecosystem preserved under volcanic ash" by Jason Hilton
Organiser: Black Country Geol. Soc. Details: <https://bcgs.info/>

18 "The Toba super-eruption" by Doreen van Seenus
Organiser: Kent Geologists' Group Details: www.kgg.org.uk/

18 "America - West of the Rockies" by Martin Gledhill
Organiser: Dorset GA Group Details: <https://dorsetgeologistsassociation.org/>

19 "Welsh dinosaurs" by Cindy Howells (Zoom)
Organiser: Mid-Wales Geology club Details: www.midwalesgeology.org.uk/

Please be aware that a number of clubs/societies are currently operating with a mix of live events and Zoom meetings. Please check with the organisers what model they are working to on each occasion.

18 "Satellite monitoring of our hazardous planet" by Tim Wright
Organiser: Liverpool Geol. Soc. Details: lgsecretary19@gmail.com

19 AGM & Presidential address by Hugh Tuffen
Organiser: Westmorland Geol. Soc. Details: <https://westmorlandgeolsoc.org.uk>

20 "Rock Solid 2 = feldspars" by Ros & Ian Mercer
Organiser: Essex Rock & Min. Soc. Details: <http://www.erms.org/> (Stanway)

20 "Footprints from the past: the nature and value of the UK's dinosaur track record" by Kirsty Edgar
Organiser: Black Country Geol. Soc. Details: <https://bcgs.info/>

21 "Antarctica's buried landscapes" by Stewart Jamieson (Zoom)
Organiser: North Eastern Geol. Soc. Details: <https://www.negs.org.uk>

26 "Are dinosaurs warm or cold blooded?" by Alfio Chiarenza
Organiser: Leicester Lit. & Phil. Soc. Details: <https://www.charnia.org.uk/>

26 "Geoconservation in Scotland" by Mike Browne

March

3 Presidential address by Alison MacLeod
Organiser: Reading Geol. Soc. Details: rgs.secretary@btinternet.com

4 "The history and importance of the Ludlum mineral collection" by Mike Rumsey
Organiser: Essex Rock & Min. Soc. Details: <http://www.erms.org/> (Shenfield)

4 "A revision of the Ordovician volcanoclastic and Caledonian structural evolution of Northern Eryri - why change the status quo?" by Alistair Baird
Organiser: Liverpool Geol. Soc. Details: lgsecretary19@gmail.com

5 "Aspects of the geology of the Hampshire Basin" by Tony Cross
Organiser: Brighton & Hove Geol. Soc. Details: <https://www.bhgs.org>

7 "British Palaeolithic archaeology in 2025" by Matt Pope (Zoom)
Organiser: Geologists' Association
Details: <https://geologistsassociation.org.uk/lectures/>

8 "Dealing with the legacy of contaminated land across Wales" by Jeremy Hucker
Organiser: South Wales GA Details: <http://swga.org.uk/>

10 "Geology of Gerrotxa (NE Spain)" by John Williams
Organiser: Huddersfield Geology Group.
Details: <https://www.huddersfieldgeology.org.uk/talks/>

10 "Crossrail construction" Ursula Lawrence
Organiser: Cambs. Geol. Soc. Details: <http://www.cambsgeology.org/events>

11 "Palaeobotany and the Tibetan Plateau" by Bob Spicer
Organiser: West of England GA Details: <https://www.wega.org.uk/>

11 "Practical session: ice ablation" by Maggie Williams
Organiser: Liverpool Geol. Soc. Details: lgsecretary19@gmail.com

11 "Lunar geology" by Ian Crawford (Zoom)
Organiser: Amateur Geol. Soc. Details: www.amgeosoc.wordpress.com

12 "The role of the Ediacaran strata of the Longmynd in determining the severity of Earth's first mass extinction" by Alex Liu
Organiser: Shropshire Geol. Soc. Details: www.shropshiregeology.org.uk

12 "Living with a volcano" by Blaise Mafuko (Zoom)
Organiser: Harrow & Hillingdon Geol. Soc. Details: <https://www.hhgs.org.uk/>

12 "Bologna stone: a curious tale of persistent photoluminescence" by Frank Ince
Organiser: Leicester Lit. & Phil. Soc. Details: <https://www.charnia.org.uk/>

12 "Glacial surges in Svalbard and Scotland" by Doug Benn
Organiser: Edinburgh Geol. Soc. Details: <https://www.edinburghgeolsoc.org/>

12 "Himalayan geology" by Danny Clarke-Lowes
Organiser: Cumberland Geol. Soc.
Details: <https://www.cumberland-geol-soc.org.uk/events/>

13 "Sources of stone at Stonehenge" by David Nash
Organiser: Mole Valley Geological Society. Details: www.mvgs.org.uk

13 "Rocks & minerals under the microscope" by Brian Lines
Organiser: Kent Geologists' Group Details: www.kgg.org.uk/

18 "The art of sand Part 2: Iowa" by Phil James
Organiser: Dorset GA Group Details: <https://dorsetgeologistsassociation.org/>

18 "The art of sand, from the Isle of Wight to Iowa" by Phil
Organiser: Dorset GA Group Details: <https://dorsetgeologistsassociation.org/>

19 "Geoforensic case study: Otzi Ice Man" by Cynthia Burek (Zoom)
Organiser: Mid-Wales Geology club Details: www.midwalesgeology.org.uk/

19 "Five Hundred million years that changed the world: geological travels in South Africa through Earth's first oxygenation" by Stefan Schroeder
Organiser: Westmorland Geol. Soc. Details: <https://westmorlandgeolsoc.org.uk>

20 Hands-on cross sections in geological maps
 Organiser: Essex Rock & Min. Soc. Details: <http://www.erms.org/> (Stanway)
 20 "Ecosystem recovery following the Permo-Triassic mass extinction"
 by Annabel Nichols Organiser: Leeds GA Details: <https://leedsga.org.uk>
 20 "Alpine peaks and salt intrusions - geological windows into deep Earth's mantle" by Jonathan Turner
 Organiser: Black Country Geol. Soc. Details: <https://bcgs.info/>
 21 "The onset of modern style plate tectonics" by Craig Storey
 Organiser: West Sussex Geol. Soc. Details: <http://www.wsgs.org.uk>
 26 "Preparation of recent fossil discoveries from the Jurassic of Kimmeridge"
 by Steve Etches
 Organiser: Leicester Lit. & Phil. Soc. Details: <https://www.charnia.org.uk/>
 26 "Mapping at Qassarsuk, southern Greenland" by Ulla Filipowicz
 Organiser: Edinburgh Geol. Soc. Details: <https://www.edinburghgeolsoc.org/>

April

1 "African roots for the dinosaur free" by Paul Barratt
 Organiser: Essex Rock & Min. Soc. Details: <http://www.erms.org/> (Shenfield)
 1 "The colour of obsidian and other things" Frankie Haywood
 Organiser: West of England GA Details: <https://www.wega.org.uk/>
 2 "Unmanned aerial photogrammetry of sea cliff erosion" by John Barlow
 Organiser: Brighton & Hove Geol. Soc. Details: <https://www.bhgs.org>
 4 "The Mull dyke swarm" by Joe Cartwright (Zoom)
 Organiser: Geologists' Association
 Details: <https://geologistsassociation.org.uk/lectures/>
 7 "Neolithic archaeology and environment history in the Kennet Valley"
 by Martin Bell
 Organiser: Reading Geol. Soc. Details: rgs.secretary@btinternet.com
 9 "Volcano monitoring and new inputs for eruption forecasting models"
 by Liz Gaunt (Zoom)
 Organiser: Harrow & Hillingdon Geol. Soc. Details: <https://www.hhgs.org.uk/>
 10 "The surface of Mars as seen by Curiosity Rover - a robotic field geologist"
 by Joel Davis
 Organiser: Mole Valley Geological Society Details: www.mvgs.org.uk
 10 "Epping Forest through geological time" by Mike Lambert
 Organiser: Hertfordshire Geol. Soc. Details: <https://www.hertsgeolsoc.org.uk/>
 10 "The Triassic of Warwickshire" by Joe Mazgajcyk & Kieren Quigley
 Organiser: Black Country Geol. Soc. Details: <https://bcgs.info/>
 11 "Underwater geology" by Chris Bohea
 Organiser: West Sussex Geol. Soc. Details: <http://www.wsgs.org.uk>
 14 "The Permian of the Wakefield District" by Tony Felski (Zoom)
 Details: <https://www.huddersfieldgeology.org.uk/talks/>
 14 "Shooting stars and space rocks" by Paul Fellows
 Organiser: Cambs. Geol. Soc. Details: <http://www.cambsgeology.org/events>
 16 "Structural and mineralogical problems in the Corris Slate Bed"
 by David Mason (Zoom)
 Organiser: Mid-Wales Geology club Details: www.midwalesgeology.org.uk/
 17 "Pietre Dure - hard rock mosaic pictures" by Ruth Siddall
 Organiser: Essex Rock & Min. Soc. Details: <http://www.erms.org/> (Stanway)
 17 "The Askrigg Block-Craven transition on the Pateley Bridge Sheet"
 by Colin Waters Organiser: Leeds GA Details: <https://leedsga.org.uk>
 22 "The Variscan orogeny: its causes and consequences" by Alan Driscoll
 Organiser: Dorset GA Group Details: <https://dorsetgeologistsassociation.org/>
 25 "Fissures and fills and why they matter" (Zoom)
 Organiser: Westmorland Geol. Soc. Details: <https://westmorlandgeolsoc.org.uk>

day field trips & visits

Please ensure that you contact the organisers in advance of any field trip advertised. Please don't just turn up, it may be for members only.

March

1 Field visit to Caesar's Cam, Farnham
 Organiser: Harrow & Hillingdon Geol. Soc. Details: <https://www.hhgs.org.uk/>
 1 Field visit to Bulls Lodge Quarry and Channels Mammoth tour
 Organiser: Essex Rock & Min. Soc. Details: <http://www.erms.org/>
 8 Geoconservation at Castle Hill woods, Dudley
 Organiser: Black Country Geol. Soc. Details: <https://bcgs.info/>
 10 Field visit to Maidstone Museum
 Organiser: Harrow & Hillingdon Geol. Soc. Details: <https://www.hhgs.org.uk/>
 15 Hade Edge, West Yorkshire with Bob Appleyard
 Organiser: Huddersfield Geology Group.

Details: <https://www.huddersfieldgeology.org.uk/talks/>
 23 Gravestones in Oxford with Nina Morgan and Philip Powell
 Organiser: Reading Geol. Soc. Details: rgs.secretary@btinternet.com

April

1 Field visit to Wigginholt, Dorset with David Shilston
 Organiser: West Sussex Geol. Soc. Details: <http://www.wsgs.org.uk>
 5 Field visit to the Chilterns Organiser: Geologists' Association
 Details: <https://geologistsassociation.org.uk/lectures/>
 5 Field visit to see Arden Sandstone with Stuart Burley
 Organiser: Black Country Geol. Soc. Details: <https://bcgs.info/>
 13 Sunken lanes of Sussex with John Broadman
 Organiser: Reading Geol. Soc. Details: rgs.secretary@btinternet.com
 26 Visit to British Cave Research Association in Buxton
 Details: <https://www.huddersfieldgeology.org.uk/talks/>
 26 Field visit to Lesnes Abbey & woods
 Organiser: Harrow & Hillingdon Geol. Soc. Details: <https://www.hhgs.org.uk/>

May

17 The Todmorden area with Ian Warrington and local experts
 Details: <https://www.huddersfieldgeology.org.uk/talks/>

residential field trips

March

30-April 6 The Isle of Arran with Chris Darmon & Colin Schofield
 Organiser: Down to Earth Details: downtoearth@geosupplies.co.uk

May

6-9 Field trip to Kent with Simon Drake, Geoff Downer and Ken Cole
 Organiser: Reading Geol. Soc. Details: rgs.secretary@btinternet.com

June

1-6 Scarborough on the Yorkshire Coast with Chris Darmon
 Organiser: Down to Earth Details: downtoearth@geosupplies.co.uk
 11-18 Isle of Mull & Ardnamurchan with Chris Darmon & Colin Schofield
 Organiser: Down to Earth Details: downtoearth@geosupplies.co.uk
 13-15 Kendal and the Central Lakes with Richard Wrigley
 Organiser: Geologists' Association
 Details: <https://geologistsassociation.org.uk/lectures/>
 25-30 The Western Lake District with Chris Darmon & Colin Schofield
 Organiser: Down to Earth Details: downtoearth@geosupplies.co.uk

July

4-6. North East England & SE Scotland with Alison Tymon
 Details: <https://www.huddersfieldgeology.org.uk/talks/>
 9-16 Heart of Wales with Chris Darmon & Colin Schofield
 Organiser: Down to Earth Details: downtoearth@geosupplies.co.uk

August

9-16 Peak District Summer School with Chris Darmon & the team
 Organiser: Down to Earth Details: downtoearth@geosupplies.co.uk

October

8-15 Torbay & South Devon with Chris Darmon & Colin Schofield
 Organiser: Down to Earth Details: downtoearth@geosupplies.co.uk
 16-19 Field visit to Anglesey
 Organiser: Farnham Geol. Soc. Details: <https://www.farnhamgeosoc.org.uk/>

2026 September

13-22 The North & Eastern Fjords of Iceland with Chris Darmon
 Organiser: Down to Earth Details: downtoearth@geosupplies.co.uk

fairs, shows & special events

February

22 Essex Gem & Mineral Show, at North Romford Community Centre, Clockhouse Lane, Collier Row RM5 3QJ. Admission £2.00, children free.
 Organiser: Essex Rock & Mineral Society.
 Details: <https://erms.org/essex-gem-mineral-show/>



Yorkshire Santa goes underground...

Many of you will be aware of the banter that goes on between your Editor and your Assistant Editor, with one living in Yorkshire and the other in Lancashire. Well the Editor came across one definite Yorkshire claim to fame this Christmas!



Santa got displaced from his normal above ground grotto at the National Coal Mining Museum and 'set up shop' instead in his temporary underground grotto - top that Lancashire! One wonders what was at the top of his young visitors' wish lists.

The marketeers at Caphouse Colliery sure know how to grab an opportunity. This little stunt made it into the press, online and even on the local TV. I bet Santa was glad when his shift was over.

Our kind of stone circle...

Around the country there are lots of stone circles, a Derbyshire one even popped up as my screen saver the other day. Whilst they are often of geological interest it's not their prime purpose. They were set up by ancient peoples as a site of religious significance or even for ancient rituals. The exact purpose of many such stone circles is shrouded in mystery.

However one stone circle, close to the Caledonian Canal (and also the Great Glen Fault) at Banavie is not ancient and is dedicated to the science of geology.



The Kilmallie Stone Circle with rocks from Lochaber Geopark.

Called the Kilmallie Stone Circle, it was established a few years ago by the Lochaber Geopark to showcase the rich variety of rocks within the area.

Our kind of restaurant?

Down to Earth reader **Richard Mann** spotted this sign to a 'geological restaurant' whilst on his travels. No complaints here if the food was rock hard, then!



Don't rush to find this restaurant, from the phone number I guess that it's not here in the UK, despite +44 being the UK's international dialling code. Incidentally, a quick internet search revealed that there are several similarly named restaurants in Britain with plenty of puns claiming that they serve 'the best food on Earth'!

Things aren't always what they seem...

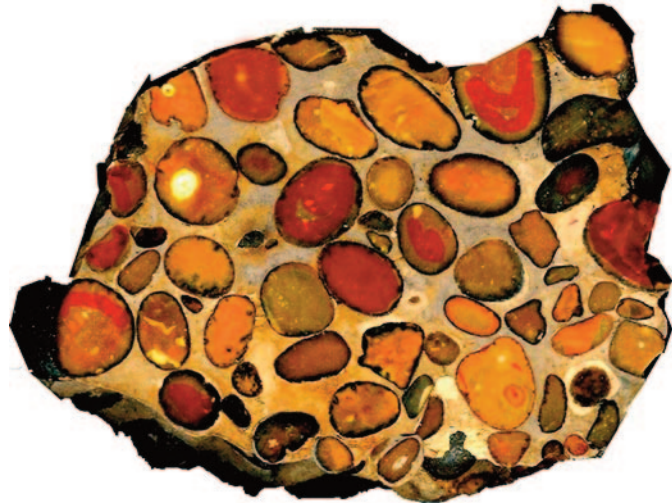
Over the past couple of weeks, while we've been enduring some pretty bad weather, *Down to Earth* readers, **Tim and Christine Freeman** have been joining us on our live Zoom session from sunny Lanzarote in the Canary Islands. They spotted these fake 'cooling columns' at an aquarium in Costa Tegui.



Strange but true 1...

Here in the Geo Supplies office we get lots of phone calls, some of which are undoubtedly potential scams, but we also get some pretty odd genuine ones, along with similar emails.

Recently Chris took a call from a builder called Tommy, who had been digging a hole at a site in Hertfordshire. He initially asked about the Puddingstone that is famous across the county. It soon became clear that his interest was not academic, it was business. So my suggestion that he contact a local museum, fell on very deaf ears!



In case you didn't know, this is a beautiful polished slice of the famous Puddingstone. (Image: East Herts. Geology Club)

From his follow-up email, it was clear that he had struck a large lump whilst carrying out a shallow excavation and he was looking to turn his find into hard cash. This is what he had to say in his email: "I have recently dug out a very large Hertfordshire puddingstone and I'm looking to sell it. Its between 300-400kg. Would you be, or know anyone who would be, interested in it?"

I wonder if he had any takers?

Strange but true 2 ...

We never cease to be amazed by some of the actions taken in good faith by people who just don't understand geology, or in this case, common or garden rocks!

This is a genuine email from a school in the south of England:

"I was hoping to ask for some more information on the 'Ultimate rock collection: igneous, Sedimentary & Metamorphic'. Unfortunately our school rock collection was disposed of by the schools radiation protection officer and I am interested in looking to replace it.

Can I ask what the total number of rocks is in the set and the number of varieties of rocks as we have on average 30 students to a class, would there be sufficient numbers for practical's. Can I also ask if they are suitable to be handled within the class room."

I have to say that our first reaction to this was 'how sad' and 'what a waste' of the rocks. My guess is that the problem was slightly raised levels of radiation coming from a granite from Southwest England.

Worryingly, would the replacement rocks fail the inspection by the radiation protection officer and end up in the bin?

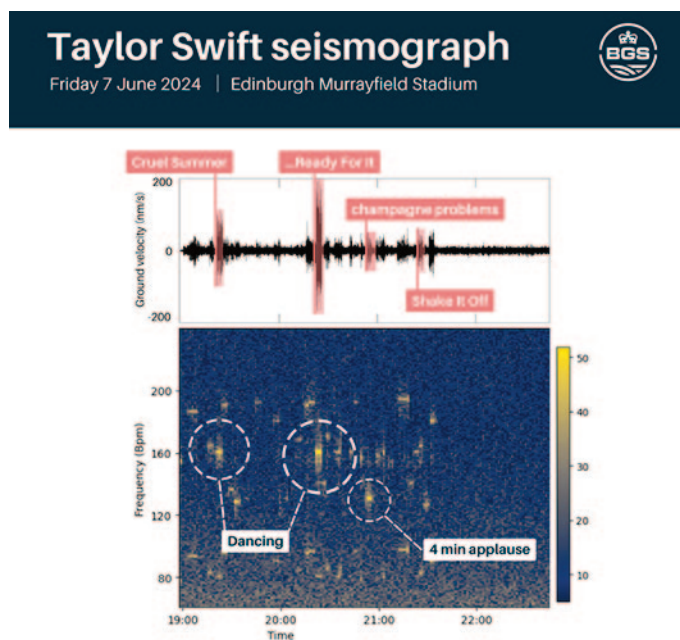
Meanwhile the 'Swifties' in Edinburgh make the Earth move...

In June of last year, pop superstar Taylor Swift played to more than 200,000 fans (known as Swifties) over three nights in the city of Edinburgh. When she asked her loyal fans to 'shake it off', they did so literally and it was picked up at the BGS earthquake monitoring station some 6km away. And it seems the 73,000-strong Friday night crowd danced, cheered and stomped the loudest of the three gigs.

This is what BGS had to say:

Taylor Swift's record-breaking concerts in Edinburgh have now been scientifically recognised as 'ground shaking', with earthquake readings being detected up to 6 km from the venue.

BGS monitoring stations around Edinburgh recorded seismic activity generated by the concerts. Each of the three evenings followed a similar seismographic pattern, with '...Ready For It?' 'Cruel Summer' and 'champagne problems' resulting in the most significant seismic activity each night.



And finally...

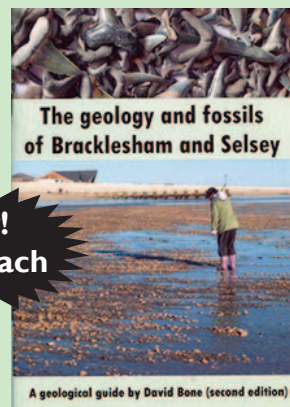
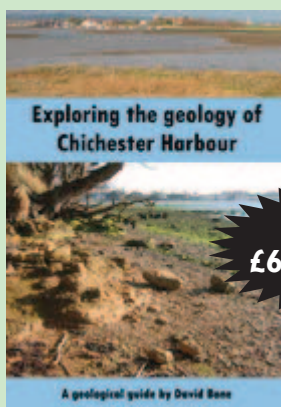
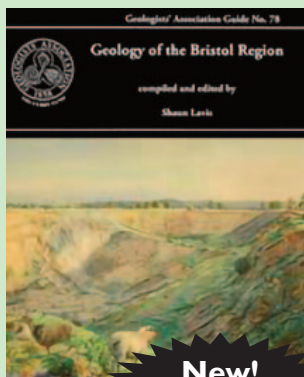
This strange 'no parking' sign was spotted on a high wall in front of a cliff near Minehead in Somerset. Somebody definitely has a sense of humour.



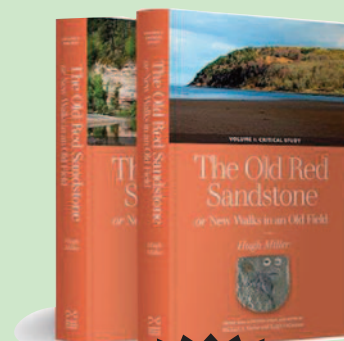
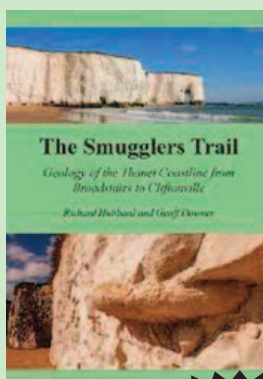
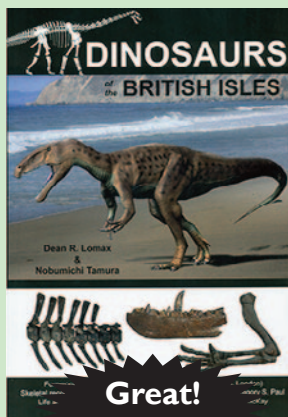
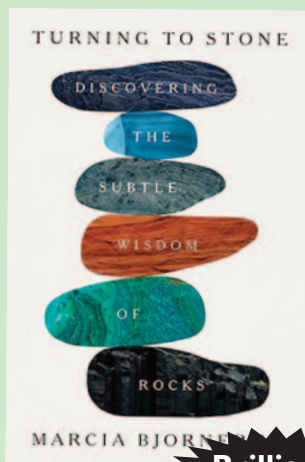
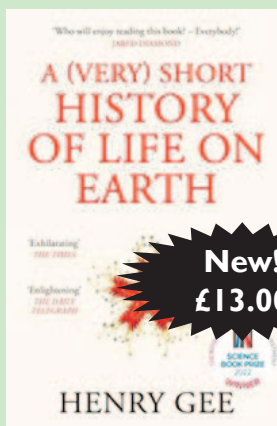


Featured books February to April

In each issue we are pleased to be able to introduce you to a range of featured books. Where they are being offered at reduced prices, these will be current to the end of April 2025 provided that stocks are available. Please note, all prices include UK postage.



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