Down to Earth

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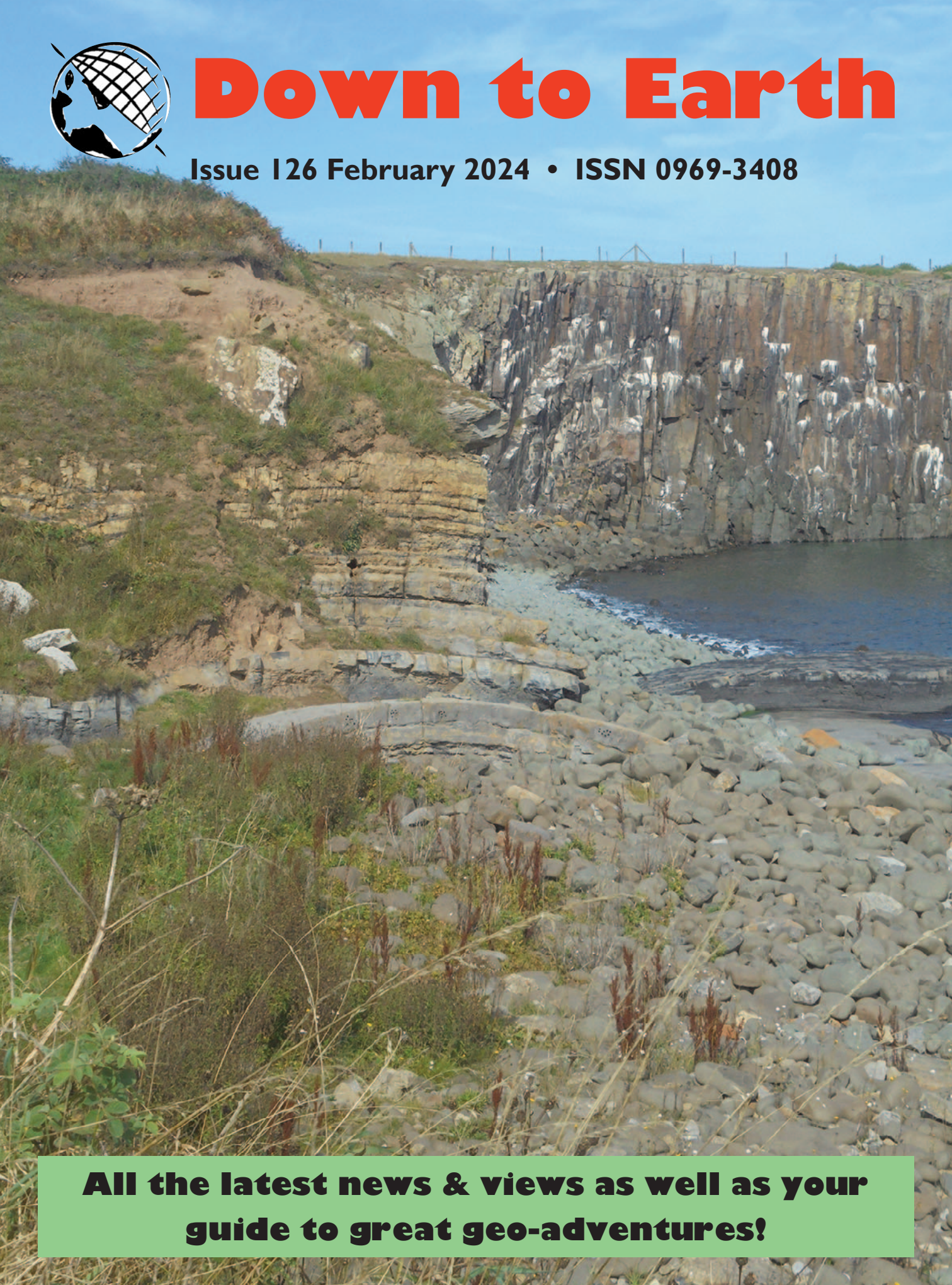

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Geology is right on the doorstep of our hotel in Porthcawl - this is the beach with rocks a-plenty! (Image: Pinternet)

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We welcome your contributions, which should be with us no later than January 15th 2024 for the February issue.

If you would like to advertise with us, please ask for a media pack.

cover story

Unfortunately nobody seems to have told the seabirds that this cliff at Cullernose Point in Northumberland was to feature on the cover of Down to Earth! Guano aside, this is the Great Whin Sill with gently domed Carboniferous strata in the foreground.

(Image: Chris Darmon)

editorial

Spa Towns - where geology meets the entrepreneurs head on!

Have you ever considered the geology of UK spa towns? Neither of your editorial team had until they did the research for a recent Zoom talk on the subject.

I guess that most people would say that what united the twenty plus spa towns in England and Wales was that it was all about the availability of suitable groundwater. Whilst this is true, it's far more than that.

Famous spa towns like Bath and Harrogate go back a long way. In the case of Bath right back to Roman times, but others are far more recent. The late eighteenth and early nineteenth centuries saw a rmassive rise in the popularity of spas for medicinal purposes. A number of places were in competition to become the most exclusive spa destination.

It's at this point that the 5th Duke of Devonshire, William Cavendish constructs the elegant Crescent in Buxton to rival Bath. Ironically it's all being done on the back of the huge profits that he's taking from operating the world's richest copper mine at Ecton in the nearby Peak District.

So yes, we do need an excellent flow of groundwater. The geology and especially the structures such as faults and heavily jointed rock do have to be right. This s the case with the Malvern Hills, where we get saline water on the eastern side where the Triassic comes up against the East Malvern fault. And the pure water of the western side from deep circulation in the cracked Malvernian.

The four Welsh spa town of Llandrindod, Builth, Llanwrtyd and Llangammarch, all sit close to a NE-SW series of faults, where the salty water probably come from the Downtonian rocks. All well and good, but they are nothing without a non-geological ingredient. That is an entrepreneur prepared to pump money into the facilities and then to market the spa.

Some of our spa towns were in fact only discovered by accident, or as a result of a totally different enterprise. One such place is Woodhall Spa in Lincolnshire. Here, a borehole was being sunk in the hope of reaching coal. But before giving up on that idea, they came across a good flow of water and thought, this would make an excellent spa!

As for the most unlikely spa, perhaps that accolade goes to the Leicestershire village of Shearsby. This tiny village, near Lutterworth was a holy well that was converted to a spa in the first half of the nineteenth century. It's now the home of the Bath Hotel, a popular wedding venue, and yes, a spa.

I'll leave the final word to a young man who features in a very short youtube film which shows the historic chalybeat (saline) spring in Rock Park at Llandrindod Wells in Powys. He's filmed taking a sip of the saline and sulphurous water. As for his reaction - it's that this is the. most putrid water he's ever tasted and that he's minded to sue the council!

Yes, there's more to spa towns that geology, but the research is fun.

Chris Darmon, Editor

news up front

A digest of some of the latest Earth Science news from around the world.

The on, off story of volcanic eruptions in the Reykjanes Peninsula of Iceland...

It's almost like it's another week, another volcanic eruption in Iceland's Reykjanes Peninsula! No sooner has one eruption ended and there's another coming along in a slightly different place. To be fair, that's exactly what Iceland's Meteorological Service, who are responsible for earthquake monitoring, have been predicting and they have been extremely accurate. Indeed, its thanks to their constant monitoring that we're able to bring you so much information.

The clear implication is that there's an extensive magma chamber at very shallow depths, that's looking for an exit. Each time we get the same pattern. It begins with a swarm of earthquake activity, followed by upwards doming of the crust and surface cracking. Things then progress to a coalescing of activity around a particular point of crust which then leads on a brief period of vigorous eruption of highly fluid lava.

In the latest eruption, the story begins on January 14th. with lava spewing forth at a site just to the north of Grindavik. Lava and ash could be seen flowing southwards and several buildings in the town were set alight. However as everyone had been advised to leave in November no casualties were reported.

Eruption just to the north of Grindavik on January 15th. by the very next day it had just about stopped.
(Image: Visit Iceland)

Workers who had been constructing a rock barrier to protect the town found themselves in the firing line, but aerial footage shows that the banks already completed did play a part in deflecting the latest lava away from the town.

Meanwhile, no volcanic activity has been visible since January 16 and the eruption has been declared over. We await the next instalment!

Meanwhile over at the nearby Blue Lagoon...

The internationally famous tourist attraction known as the Blue Lagoon has been seriously impacted by the recent volcanic activity on the Reykjanes Peninsula. It was first forced to close back in November and then reopened in early January only to be forced to close for asecond time on January 15th. However this second closure was only for four days, with the attraction back open on January 19th. but for how long?

The Blue Lagoon during one of its recent periods of being closed due to an eruption taking place nearby. (Image: Travel Gossip)

This comes from their website: "A volcanic eruption commenced southeast of Hagafell mountain on the morning of January 14. Following an increase in seismic activity detected in the area on the previous night, we took the precautionary measure of evacuating all our operational units.

According to recent reports from the Icelandic Meteorological Office, it appears that the volcanic eruption may have ceased. The current eruption site is at a safe distance from Blue Lagoon."

The site is now protected by a barrier formed from volcanic material piled around the site. Teams have worked around the clock to construct this, so irportant is the Blue Lagoon to Iceland's tourist based economy.

However, there have been some physical, and chemical changes within the confines of the Blue Lagoon which is fed from locally derived groundwater. Some parts of the site are now hotter and the operators have had to add in cold water to ensure the safety of visitors. More worryingly, there have also been, so far unspecified, changes to the chemical content of the water.

The dissolved salts in the water are what give the Blue Lagoon its importance, especially to those visitors who are there to treat their bodies. It is understood that this is particularly the case for some of the many Germans who visit the Blue Lagoon. Indeed, some German visitors are paid to come by their health authorities.

Meanwhile, beneath the Vatnajökull Glacier is the Grimsvötn Volcano beginning to stir?

In the southeast of Iceland lies the mighty Vatnajökull Glacier beneath which lies the active, but quiet since the last stirrings in November and December 2021, Grimsvötn Volcano. It is famous for melting the overlying ice cap, causing what are called jökulhlaups, which can destroy the bridges on Highway 1 which passes close by to the south.

Seismic activity occurred on January 11th, leading the Reykjavik Grapevine to report:
"The Department of Civil Protection and Emergency Management has declared an uncertainty phase around Grimsvötn volcano, as an ongoing jökulhlaup (a glacial outburst flood) could herald an eruption. Grimsvötn is a volcano located under the Vatnajökull glacier, in the southeast of Iceland.

Grimsvötn last caused the overlying ice to melt in November and December 2021. could it be about to happen again?
(Image: Smithsonian Institution, Global Volcano Programme)

In addition to the glacial flooding, Grímsvötn was shook by a 4.3 magnitude earthquake around 07:00 Thursday morning. That is the largest quake recorded in the area since measurement began in 1991. Geologist Magnús Tumi Guðmundsson told the national broadcaster Grímsvötn is currently in a period of heightened activity, which could last 60 to 80 years.

The glacial flooding has been ongoing for a couple of days and is considered small. It is not expected to cause any damage to roads or settlements. Magnús Tumi explains that "when there are glacial floods, the water level in Grímsvötn drops, and then the pressure on top of the magma chamber that is under there decreases."

The Icelandic Meteorological Office has a summary of the various types of glacial outburst floods and what causes them.

An eruption followed a glacial flood at Grímsvötn most recently in 2004. Prior to the 2004, eruptions of the volcano followed glacial floods in 1934 and 1922. Glacial floods have also occurred at Grímsvötn without an eruption following, in 2021 and 2022, for example."

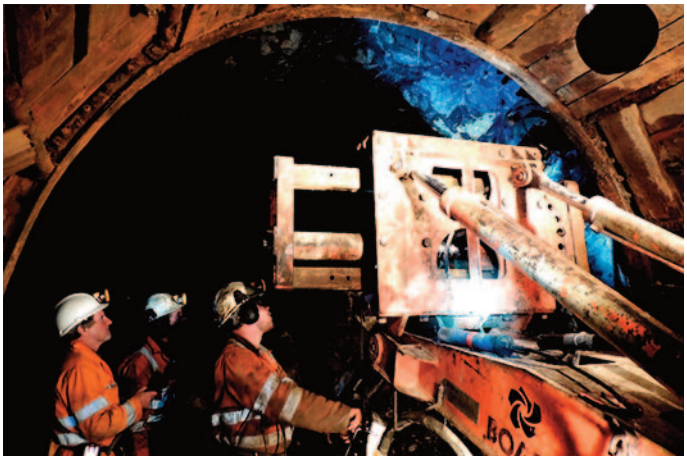
Mining and processing of Fluorite ends in the Peak District...

It has happened before, but this time it looks much more permanent, with the closure of the last remaining Fluorite mine in the Derbyshire Peak District. This time, the processing plant at Cavendish Mill, south of the village of Stoney Middleton is also in the process of being dismantled, according to local reports.

The previous operations were run by Laporte Industries and involved several mines around Eyam and Stoney Mddleton which closed one by one, until there was just one remaining mine, Milldam near to Great Hucklow.

Within 12 months of Laporte being taken over by a Mexican company, and in 2010, all mining and processing of Fluorite had ceased. However the Milldam Mine was acquired by Fluorsid British Fluorspar in 2011 and subsequently reopened in 2013, and once again the processing plant at Cavendish Mill was back in business as well.

Prices and demand for Fluorite have fluctuated in recent times and Milldam Mine has had to deal with this along with the fact that the plant and machinery both down the mine and at the processing plant were in need of updating and heavy investment.



Inside Milldam Mine in happier times.
(Image British Fluorspar)

In September the decision was made to close down the entire operation both at the mine and at Cavendish Mill. This has been reported by Great Hucklow Parish Council.

This is what the Parish Council reported:

"Fluorsid British Fluorspar (FBFL) have recently ceased operations at Milldam Mine and Cavendish Mill. Nearly all staff have been made redundant and there is now only a core of 5 workers who will be responsible for keeping the mine on "care and maintenance". FBFL say they have stopped mining because the mineral extraction

operation was operating at a loss and they need to focus on making a 'section 73' application. This is basically a request to vary the planning consent which they already have so that it better reflects the way they are actually operating. Preparation of the application is expected to take up to 18 months.

The main entrance to Milldam Mine in happier times (Image: Mindat)

FBFL have been stripping out and selling all of the equipment from the mine and the Mill. This may appear to be disposing of resources which they will need for returning the mine to production when that day comes. However, in the overall context of running a multinational, multi-million pound operation, the cost of selling the equipment (much of which is very old and very tired) to raise some cash with which to help pay off FBFL's current debts seems like a sensible measure since the replacement of old, tired kit with new equipment will aid the profitability of the operation in the long-term.

Most importantly for local residents and landowners on Hucklow Edge, the work to re-fill the stope collapse holes is continuing despite nearly all other operations being stopped. In the longer term there is a question about where the material to re-fill the holes comes from if the mine is not operating, but for the moment the plan to fix the holes is continuing despite the mine being closed. The next step is to perform a survey across the SHS site with a ground penetrating radar to try to determine if there are any voids which could present a danger to the operation of earth moving machinery on the site. Once this is complete then the plan to move material from the stock pile already located at the eastern boundary of the SHS site can move forward.

So, in summary, the message is that (1) the mine has not been abandoned, it has just stopped production in order to minimise financial losses, and will re-open in due course; (2) work to remediate the ground collapses is continuing; and (3) members of the Parish Council and the SHS Management Committee are in daily contact with FBFL, Peak District National Park Authority and others to ensure that the interests of the village are taken into account."

Anglesey Mining plc reports strong assay results...

The Company who are seeking to mine for copper in the Parys Mountain area of Anglesey, Anglesey Mining plc, have reported strong assay results from their drilling programme. The hole code named NCZ001 is situated in the Northern Copper Zone and was designed to provide a repeat of a similar hole H34 that was drilled in the 1970s.

The new hole confirms a similar set of results with at least three mineralised zones with copper levels exceeding 5% in a couple of places and with high levels of Pb and Zn. Andrew King, chairman of the Company said: "We are very encouraged by the broad widths encountered across both the Garth Daniel and Northern Copper Zones in NCZ001. In particular, we are excited to see the significant intersection within the Garth Daniel Zone. The 22-metre intersection grading 3.7% copper equivalent we believe continues to demonstrate the prospectivity of the Parys Mountain mineralised system."

"Infill drilling of these mineralised zones will play a crucial role in the development studies for Parys Mountain. The primary target for this programme is to provide additional pierce points to enable the current Inferred resources to be upgraded to the Indicated category. The second drill hole, NCZ002, is currently at a depth of around 360 metres with the Northern Copper Zone target estimated to commence at a downhole depth of around 420 metres".

The Editor comments: I'm reminded of an old song "another brick in the wall". The process of upgrading a prospect from 'inferred' to 'indicated' is a vital step along the way to this becoming a viable mine. Each drill hole is helping the Company to build up a picture, that will, or will not, encourage investors to provide the necessary capital for this to move forward. It's a slow and painstaking process but this is indeed encouraging.

Author: Gerald Lucy & Mike Howgate

Illustrations courtesy of authors unless shown.

Celebrating the Ashdon Meteorite at 100...

One day in March 1923, a meteorite fell to the ground close to the North Essex village of Ashdon, not far from Saffron Walden.

It became known, not surprisingly, as the Ashdon Meteorite. Here, albeit a little belatedly, Gerald Lucy and Mike Howgate celebrate the event...

The centenary of the fall of the Ashdon Meteorite in March 2023 provided the ideal opportunity to promote science and involve the local community.

Frederick Pratt standing over the hole made by the Ashdon meteorite, the fall of which he witnessed. The photo was taken in June 1923, three months after the fall. (Photo: Natural History Museum, London)

On 9 March 1923 Frederick Pratt, a thatcher by trade, was working in the corner of a wheat field close to the village of Ashdon, near Saffron Walden in north Essex when, about 1pm, he heard a strange hissing sound and looked up, supposing it to be an aeroplane. A second or two later he saw an object fall about thirty yards from him into the field causing the earth to 'fly up like water'. Three days later, in the company of another worker on the farm, he dug up an unusual stone from a depth of about two feet and passed it to his local vicar, the Rev. Francis Berry, who later donated it to the Natural History Museum in London. Scientific investigation by the museum proved beyond doubt that the stone was a meteorite. This was an object that had travelled billions of miles in space and was about 4.5 billion years old - at least ten times older than any other stone to be found in the soil of Essex.

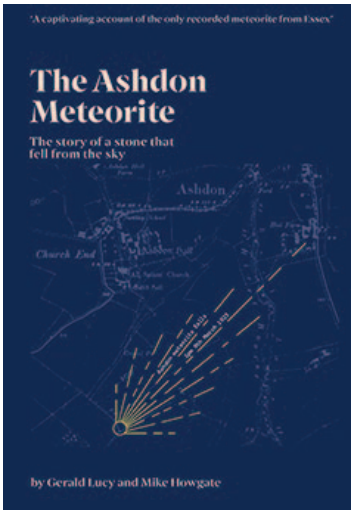
This meteorite, and the story of its discovery, has fascinated us for years, and as the centenary of the fall approached, we discussed how

The Ashdon meteorite. As the leading surface melted during its flight the meteorite acquired a rounded or shield-shape. This view clearly shows the lines of melt as ridges and grooves. (Photo: Phil James)

we might celebrate it and involve the local community. Fortunately, the village of Ashdon has an excellent volunteer-run museum who were pleased to help, as were the staff of Saffron Walden Museum; both museums already having plaster casts of the meteorite on display. We knew precisely where the meteorite had fallen as the site had been recorded in a scientific paper on the meteorite published 9 months after the fall by George T. Prior, Keeper of Minerals at the Natural History Museum, and at the time Britain's foremost authority on meteorites. Fortunately, the site was close to a present-day public footpath and so we had the opportunity to erect a 'monument' of some kind. The landowner and the farmer were both supportive and so we decided on an engraved oak post to mark the spot, which was very much in keeping with this remote, rural location.

We also realised we had a wonderful human story here because the fall was witnessed. In England in the last 100 years only three other meteorites were seen to fall and were subsequently recovered. Access to the 1921 census gave us information about Frederick, including his occupation, family, and address at the time. As a bonus, in the Natural History Museum's archives there was a wonderful photograph of Frederick standing over the hole made by the meteorite and taken three months after the fall. It's also a fascinating scientific story because meteorites are a unique source of information on the

formation and early history of the Solar System and are of immense scientific value. The Ashdon meteorite is extremely well preserved and still available for study. All this, combined with the contemporary newspaper cuttings, including from The Times, made us decide that the story justified the publication of a booklet which would be a permanent written record of the event.



The oak post commemorating the fall. (Photo: Gerald Lucy)

But what about the actual Ashdon meteorite, which had resided in the Natural History Museum for a century since it was donated by the Rev. Berry, but was sadly not on public display? We felt that we couldn't have a celebration on the day without the 'star' of the show being present. A lengthy exchange of emails finally persuaded the Museum to lend us the meteorite for the day despite recently introduced rules that, bizarrely, prevent valuable objects leaving the museum. We said we only wanted to borrow it once every hundred years and finally they relented, provided it was accompanied by a member of their staff. So Ashdon Village Hall was booked, the oak post was installed, the booklet was printed, and advertising was done. Thursday 9th March 2023 was fast approaching!

The plan was to meet at midday for a walk to 'unveil' the commemorative post, then back to the village hall for the afternoon celebration. We had had a terrific response to the advance publicity which led to concerns about parking in Ashdon Village. However, the day dawned cold, with snow, sleet and rain and we then wondered if anyone would turn up! But we need not have worried. The day was a great success with over 30 villagers and guests gathered at impact site. A cheer went up as the commemorative post was unveiled at 1pm, the time exactly 100 years since Frederick witnessed the meteorite passing over his head and impacting the ground.

Following the unveiling, the rain-bedraggled party proceeded to Ashdon Village Hall where they were joined by more local residents and guests. Here they were able to view the actual Ashdon meteorite, brought here just for the day from the Natural History Museum by Dr Natasha Almeida, curator of the museum's meteorite collection. The hall was packed with an audience of over 60 people who heard Natasha give a fascinating talk on meteorites. The meteorite is a stony meteorite, is 12cm x 9cm x 6cm in size and weighs 1.27kg. It is one of the most beautiful of all British meteorites, the shape of the stone being key to reconstructing its journey through the atmosphere. It is a classic 'flight-oriented stone' with one face pointing forward during its hypersonic flight (see photograph). Frictional heating would have turned the stone into a bright fireball that melted and vaporised the surface and the melt still on the surface of the stone solidified to a glassy crust, which shows the lines of flow as conspicuous ridges and grooves.

The commemorative oak post is situated a third of a mile due south of All Saints Church, Ashdon and close to the farm road which is now a public footpath (grid reference TL 581409). A visit to Ashdon Village Museum is also recommended which has cast of the meteorite, a small display on the fall and excellent tea and cakes (open from Easter on Sundays and bank holidays 2pm-5pm). The project had the support of the Essex Rock and Mineral Society and received generous financial assistance from the Geologists' Association's Curry Fund and from Ashdon Village Museum. Articles on the meteorite have appeared in several magazines, journals, and local newspapers.

Our fully illustrated centenary booklet entitled 'The Ashdon meteorite, the story of a stone that fell from the sky' can be obtained online (price £3 plus £2 postage) at www.therockgallery.co.uk and also from www.geosupplies.co.uk. It explains in plain language what meteorites are and gives advice on what to do if you think you may have found one.

A wet but enthusiastic group at the unveiling of the commemorative post at the impact site. (Photo: Phil James)

article

Author: Sylvia Woodhead

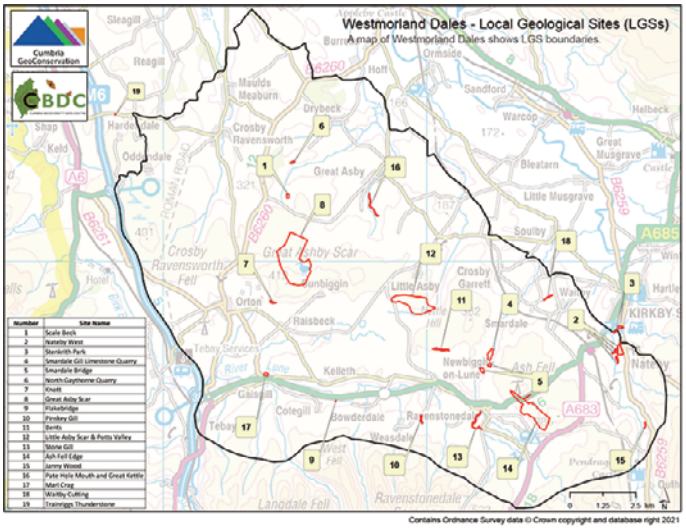
Illustrations courtesy of author unless shown.

Revealing the Foundations of the Westmorland Dales

The Northwest of England, and particularly the county of Cumbria, has an amazing geological heritage. The former county of Westmorland tends to get eclipsed by the nearby Lake District, but there's much to celebrate and to share about the foundations of Westmorland.

Sylva Woodhead from Cumbria RIGS takes up the story...

The area now known as the Westmorland Dales, formerly the Orton Fells, is part of NE Cumbria, east of the M6 which, since 2016 has been part of the Yorkshire Dales National Park. Containing the largest area of limestone pavement after Ingleborough, it has been part of a National Lottery Heritage Fund landscape partnership project, designed 'to unlock and reveal the hidden heritage of the Westmorland Dales, enabling more people to connect with, enjoy and benefit from this inspirational landscape.' Number 1 of the 21 projects has been the geology project called 'Revealing the Foundations', led by David Evans, Project Manager and Sylvia Woodhead of Cumbria GeoConservation (CGC), Special Interest Group of Cumbria Wildlife Trust.



LGS in the Westmorland Dales area (NB Blasterfield makes 20 sites)

The area's geology needed revealing. The area was on the junction of four geological maps, largely dating from the 1970s. It contained seven Local Geological Sites (LGS) designated by CGC in the 1990s, whose data sheets needed updating. In addition Friends of the Lake District had an aspiration to make their property at Little Asby Scar a LGS, and to have some more geological interpretation materials. After a visit to the 'hidden landscape- a mini Yorkshire Dale' at Scale Beck LGS, the £3.5 million HLF bid was successful in February 2017, and the project, one of six natural heritage projects, was delivered from 2019 to the end of 2023.

Dr Elizabeth Pickett was engaged to survey and map the area's geology, producing a report recommending the designation of an additional 12 LGS, and linking each geological period to landscape, biodiversity and cultural heritage. The area's geology includes the oldest Windermere Group Silurian rocks in the Howgills, seen at Lune's Bridge and in Roger Howe quarry on the new footpath to Tebay made by the project's apprentices. Most of the area is Lower Carboniferous Limestone, with more variety and iconic local names than elsewhere (Breakyneck Scar Limestone is my favourite).

Silurian Windermere Group rocks seen at Lune's Bridge

The rock types range from the Ravenstonedale Group in the south, with brownish layers of Brownber Pebble Beds and red Ashfell Sandstone between the limestone layers, to the Knipe Scar Limestone which here makes for the spectacular limestone pavement of Great Asby Scar, said to have more variety of solutional landforms than any other area. Towards Kirkby Stephen there are outcrops of the youngest rocks of the area, Permian Brockrams and red sandstone, spectacularly seen in the Stenkrith Gorge of the River Eden. The area had a complex

Looking south from limestone pavement on Little Asby over Sunbiggin Tarn to the Howgills

glacial history, with changing ice sheds, and has many intriguing meltwater channels and Shap Granite erratics, locally called Thunder Stones, one of them Trainriggs being designated a new LGS.

Erratics of Shap Granite in Blasterfield meltwater channel, locally known as 'thunderstones'

Much of the information from this report is now available as a lavishly illustrated book called ***Revealing the Foundations***. The book, written by Elizabeth Pickett, spans 450 million years of geological history and describes how the landscape that we see today has been shaped by ice and water. It is a wonderful introduction to the area and recommends places to visit. The book was launched at a geology event in Orton in October 2023.

Eroded outcrop of Carboniferous Ashfell Sandstone at the Bents

LGS on the Coast to Coast

The project has also produced a wealth of other geological interpretation materials, with new data sheets for the 20 LGS, 14 public information sheets, and six GeoTrail leaflets (Orton, Smardale, Kirkby Stephen, Blasterfield and Dina Gill, Bents and Tebay Gorge) available via the Cumbria GeoConservation web site:

www.cumbriageoconservation.org.uk.

Permian Brockram in the River Eden at Stenkrith

Further geological information, including recorded webinars and conferences, can be found via the Friends of the Lake District web site:
https://www.friendsofthelakedistrict.org.uk/westmorland-dales-hidden-landscapes-partnership

You can also go to the Dales Rocks web site of the Yorkshire Dales National Park ***https://dalesrocks.org.uk/***.

In addition 10 Earthcaches were created, and two geological interpretation boards were erected at Smardale Reserve.

During the life of the project, there have been many guided geological walks and events in the Westmorland Dales area and there are plans to continue these in the coming years. The geology of this once little known area has been put on the map and a visit is highly recommended.

Geology information Boards at Smardale reserve

Copies of this new Cumbria GeoConservation booklet can be purchased via the Geo Supplies website:

www.geosupplies.co.uk or by ringing us on 0114 245 5746

The price including UK postage is £10.00

Author: Patrick Gaffikin

Illustrations courtesy of author unless shown.

The Pleistocene Ice Age – a time of dramatic climate change

In this latest issue of Down to Earth Paddy Gaffikin takes a look at a very different topic. This time it's the Pleistocene Ice Age that gets the 'Paddy touch'.

We hope that you enjoy your read...

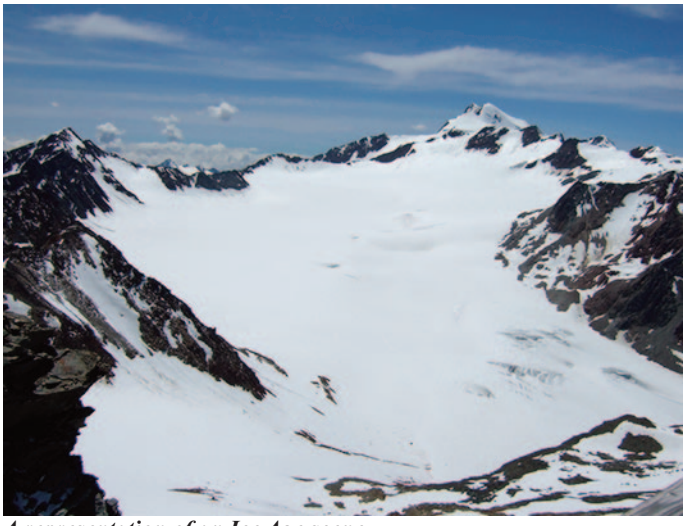
"The Ice Age carved its memorials on mountain and plain."

J. K. Charlesworth (1889-1972).
Former Professor of geology Queen's University Belfast.

The Pleistocene Epoch

The Pleistocene Epoch commenced 2.58 million years ago and ended around 11,700 years ago. It was during this time that there were a number (maybe as many as 50) of extremely cold episodes so perhaps it should be called 'The Pleistocene Ice Ages'. The very cold episodes of glaciations are also referred to as 'stadials' and these were interspersed with warmer times, which could have been warmer than today, and which are called interglacials or 'interstadials'. During glacial times it was very much colder than the coldest of our winters.

The last stadial



A representation of an Ice Age scene.
(Image: Mr. P. Millar, Belfast Geologists' Society.)

The last major glacial phase started about 30,000 years ago and ended about 14,000 years or so and was at its peak around 20,000 years ago. This was succeeded by a comparatively short interstadial, which was followed by a relatively brief glacial phase, after which there was a lengthy interstadial and we are living in that today. Ice is compressed snow. During the last major episode the ice in Britain and Ireland was, on average, over a kilometre thick and would even have covered our loftiest mountains. In fact most of the northern hemisphere as well as much of the southern hemisphere were under ice – although the glaciation in the southern hemisphere was not as extensive as in the north. Almost the only places which escaped glaciation were tropical regions.

The landscapes we see today, such as U-shaped valleys, would have been carved by ice. Almost no place in Britain and Ireland escaped being affected by glaciation and, no matter where you live on these islands, you are never far from features that were formed by ice. Sea-levels were around 100 metres lower than today because water was trapped in the ice and Britain was attached to Europe and Ireland was connected to Britain. It would have been possible, at this time, to walk from the north of Ireland to southern Europe without encountering the sea.

Ballyhillin raised beach, Donegal
(Image: TripAdvisor)

The weight of the ice would have caused land to be depressed and it would not have rebounded until the ice disappeared. Even today, in some places, the land can rebound and the result would be the equivalent of a small earthquake. Such rebounding has even occurred in Donegal in recent years. It is referred to as isostatic rebound. Some beaches, around coastal areas, were once at sea-level but are now up to 40 metres above the sea – such beaches are called 'raised beaches'. Stunning iconic scenery, like that of the Lake District, the Yorkshire Dales, Snowdonia, the Scottish Highlands, and the Glens of Antrim, just to name a very, very few, are the consequences of the action of ice.

It would not have been until the climate warmed that the ice melted and it is thought to have come to a sudden end but, even so, it is estimated the ice took hundreds of years to fully disappear. Around 8,000 years ago, the land, called Doggerland, which connected Britain to Europe, became infilled with water with the result that it made Britain the island we see today. It would have been a bit earlier that the link between Ireland and Britain was broken by the sea.

A diagrammatic representation of Doggerland. (Image:Wikipedia)

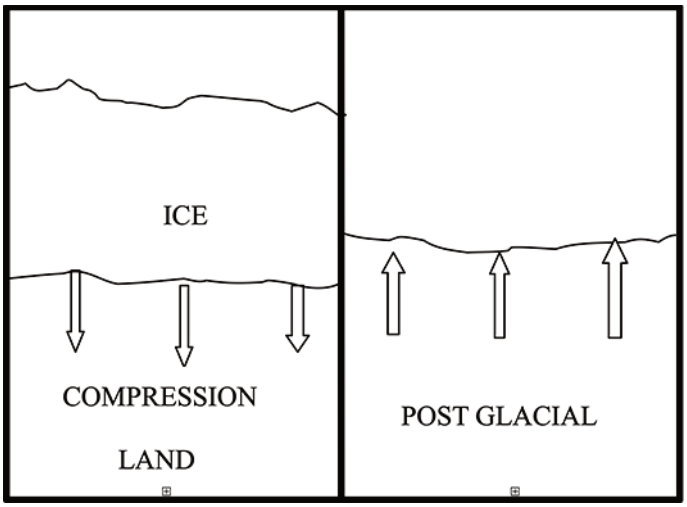


Diagram to show how isostatic rebound operates.

What causes an Ice Age?

A number of phenomena are put forward to explain the cause of an Ice Age. Most of these can be summarised under two headings: External (astronomical) causes and Internal (terrestrial) causes.

The main external causes:

- Variation in the Earth's orbit around the Sun.
- Changes in the tilt of the Earth.
- Reduction in solar heat.
- Changes in the 'wobble' of the Earth.

The main internal causes:

- Reduction in global volcanic activity and greenhouse gases.
- Variation in ocean and atmospheric currents.
- Tectonic activity.
- Mountain building periods.

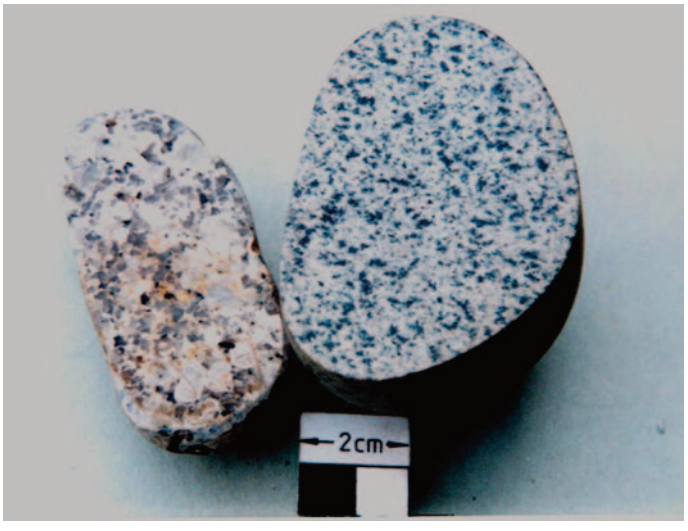
It is thought when all or most of these criteria come together an Ice Age can result.

Glacial striations

Diagram to show glacial striations.

Moving ice can transport rock debris, which resides at the sides and base of a glacier. This rock material can produce scratching (and polishing) of the rock over which it moves. Such scratches are called glacial striae and can give clues as to the directions the glaciers were moving. However, when the scratched rocks are subsequently uncovered by ice, the markings can become obliterated by weathering and therefore they are usually seen when a rock is newly exposed as at the top of the face of a quarry or at the coast.

Glacial erratics



A cut pebble of Ailsa Craig Granite, found on Dundrum beach, Co. Down. It is a glacial erratic.

Rock debris can vary greatly in size – from large boulders to fine dust. A glacial erratic is a rock, which can vary in size between a boulder and a pebble, and is carried by the ice from its original position to somewhere it is not native. One good example is the occurrence of Ailsa Craig Granite pebbles at different localities on the whole east coast of Ireland. They were transported within moving ice from Alisa Craig in the Firth of Clyde.

Cloughmore Stone, another erratic, in the Mourne Mountains (Image: Courtesy of Ireland Highlights)

Were there any humans in Britain during the Ice Age?

It is thought that hominins – distant modern human ancestors – lived in Britain 1 million years ago – or, maybe, even earlier. But theories about human occupation of Britain, during the Ice Age, are controversial because of the scarcity of ancient human fossils and artefacts. The hominins were succeeded by Neanderthals, who were followed by modern humans. Each group would have lived during the warmer spells during the Ice Age but, when the climate turned colder, would have migrated south to relatively warmer climes.

To date, the oldest fossil of a modern human found in England (in Devon) is a jaw-bone dated at between 41,000 – 44,000 years old. The oldest (British) fossil of a partial skeleton of a modern human was found, in the early 19th century, by the palaeontologist Rev. William Buckland, in a cave in southern Wales and has been dated at around 33,000 years old.

When the climate became warmer more people inhabited Britain. Although it cannot be said with certainty, around 8,000 years ago there could have been only a few thousand people living in Britain and Ireland. This scant population may have been concentrated on a few particularly well chosen sites.

Were there other Ice Ages in the geological past?

Ice Ages are not a common occurrence in the history of our planet. It is reckoned the Earth has only experienced six major Ice Ages and these have varied in duration and extremes of temperature. Probably the most intriguing one was the Late Precambrian Ice Age, which commenced 750 million years ago and lasted until 580 million years ago, and during which scientists believe there was an episode, called 'Snowball Earth', when the whole planet including even the oceans were covered in ice and snow.

All life at the time, with the exception of extremophiles, would have been obliterated before it hardly started. It is thought it ended when widespread volcanic activity produced greenhouse gases. Although it is a contentious issue, some think the Late Precambrian Ice Age may have been a trigger, or at least a factor to be taken into account, for the 'Cambrian explosion' even though it occurred millions of years after this Ice Age. (The 'Cambrian explosion' was the event at the start of the Cambrian when all the main invertebrate phyla, with the exception of the Bryozoa, first appeared.)

Is another Ice Age likely soon?

We are living in an interglacial phase. In the 1950s and 60s some climatologists were forecasting that an Ice Age was imminent and the severe winter of 1963 gave some credence to this prediction when the cold areas of England were covered in snow for over 10 weeks and even the Thames froze over. The coldest day-time temperature, in some places, was as low as -15°C. However, things improved.

Now it is claimed, by some scientists, that another Ice Age would not occur until many thousands of years into the future but other experts say it is difficult to predict.

Currently the main concern, as regards climate change, is for global warming and the real possibility that living things – including ourselves – are in danger of being detrimentally affected by it.

The Editor comments: Thank you once again to Paddy for providing you, our readers, with an excellent introduction to a subject that could run to a shelf full of books. Yet, he has managed to provide you with a taster in a mere three pages. I do hope that you've enjoyed it as much as I have.

Author: Chris Darmon

Another famous rock...

Frosterley & Dent Marbles

In this issue, you don't just get one famous rock - at no extra charge we bring you two (with a mention of a third)!

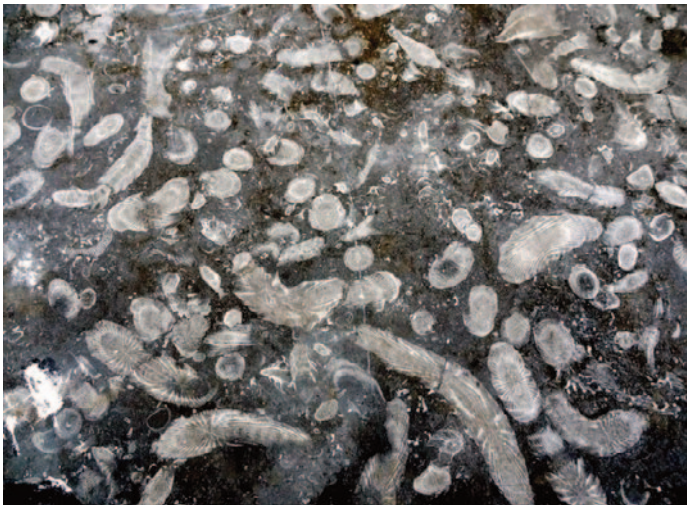
Across the UK there are very few true marbles, that is limestone that has been fully recrystallised by heat to become a metamorphic marble. However we have a number of limestones that can take a polish and then get to be known as 'marbles'.

Beginning down in the south, in the Derbyshire Peak District, the Ashford Black Limestone at Bakewell was popularised in the nineteenth century and forms several fireplaces in Chatsworth House. But it's two rocks of similar age in the Dales of Yorkshire and County Durham, at Dent and Frosterley that I want to focus on.

Frosterley Marble

This comes from The Minerals Valley Project and describes three walks:

A special type of limestone is found in Frosterley; this fossil-rich stone, known as Frosterley marble, can be polished to a high shine. Technically, it is not a proper marble. Marble is formed when limestone is heated or subjected to pressure (or both) which causes it to recrystallize into marble. This limestone has not been altered in this way. It is the white fossils, from a tropical seabed of 325 million years ago, encapsulated within the dark grained limestone which make this such a decorative stone.



Frosterley Marble with superb crinoids (Image: Wikpedia)

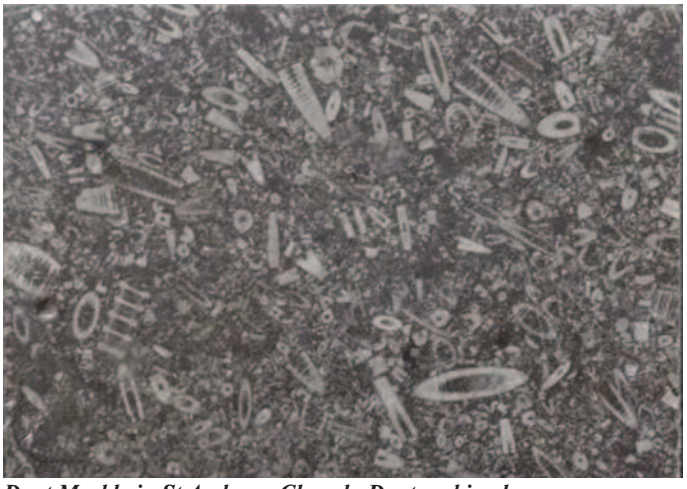
The earliest known reference to the rock is via 'Lambert the marble cutter' who is mentioned in the Bolden Book, a northern version of the Domesday Book commissioned by Bishop Hugh de Puiset in 1183.

The most famous use of Frosterley marble is in Durham Cathedral. Here, the ceiling of the Chapel of the Nine Altars is supported by slender columns of this unusual stone. The columns would have been roughly cut, possibly from the Bollihope Burn river bed, then transported to the cathedral building site. Here, industrious Norman monks would have begun the laborious process of polishing, using blocks of sandstone lubricated with water and leather cloths impregnated with fine sand and silt, to bring the stone to a smooth decorative finish. Broadwood Quarry still quarries Frosterley marble today.

Dent Marble

Dent Marble was worked in the historic past from limestone beds close to the village of Dent. This comes from the Dent Village Museum and Heritage Centre:

A black crinoidal limestone found in certain areas of Dentdale has for long been sought after because of its amazing quantity of fossil remains. It appears most noticeably in the rocks around Arten Gill, and during the late eighteenth century led to a boom in local quarrying there. The main quarry was owned by Richard Alderson whose mill at nearby Stone house was famed for producing beautifully polished fireplaces featuring the lovely white fossil patterns embedded in the background of the dark natural rock, the material itself becoming known as "Dent Marble". By the mid-nineteenth century these unique Stonehouse products were being exported worldwide, the most celebrated being a superb fireplace made in 1843 for the Winter Palace of the Tsar of Russia at St. Petersburg.



Dent Marble in St Andrews Church, Dent and in close up. (Images: Courtesy of William Fraser)

in-house

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

For those winter nights, our jigsaws are just what the doctor ordered...

Our three geologically themed jigsaw puzzles comes with all the authority you'd expect from BGS.

Choose between a modern geological map of the British Isles, an historic William Smith map or a Magnetic Rocks map with its amazing colours!

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The Cream of the Crop 2023...

As part of their travels around the British Isles, leading groups of Down to Earth readers, your editorial team Chris Darmon and Colin Schofield get to see some amazing rocks. During 2023 they encountered some absolute gems and now they want to share some of their finds with you, our readers!

'Cream of the Crop 2023' is a limited edition set of 13 rocks (it was supposed to be 12, but Chris ended up including an extra specimen by mistake) complete with notes of where they were responsibly collected.

These specimens are ideal for educational study, or for those wanting to make thin section for study down the microscope. Among the rocks included ar Lugarite, Cumbraite, Tiree Pink Marble, Lundy Granite, Ailsa Craig Riebeckite and St Peter Port Diorite.

The cost is £49.95 including UK postage.
Buy online at: www.geosupplies.co.uk
or ring us on: 0114 245 5746

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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.*
- *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

Our 2024 programme...

Bookings are going well for most of our trips, but we do still have a number of vacancies (particularly for twin and double roons). So why not come along with your partner, or your best friend?

For most of our trips booking forms have only been avalable from us, but now, as an experiment, you can book for our Stirling Summer School online via our website. What could be asier?

Take our advice and make your bookings NOW! Aside from the Summer School you'll need to contact us for a booking form.

Email: downtoearth@geosupplies.co.uk or ring: 0114 245 5746

Northwest Highlands of Scotland (8-nights) - April 10-18 £1495
We spend the whole of the trip based at the iconic Inchnadamph Hotel in Assynt. This is where the pioneers Peach and Horne were based when they surveyed the rocks and structures of the area. There's no better place from which to explore this great area. We take in the ancient Lewisian Gneisses, the Torridonian Sandstones, the sediments of the Cambrian and Ordovician and the Moine Schists. There are so many classic localities on our extensive itinerary that takes in sites right across the Geopark.
View the brochure at our website - get the booking form from us!
This trip is close to being full

This is the magnificent Quinag in Winter

Norway, land of fjords (9-nights) - April 24-May 3 £1995
At long last we are set to return to southern Norway following our last visit in 2019. This trip begins with the fjords of the Bergen area and then moves to the tiny resort of Flam, set at the bottom of a fjord and reached by a world famous railway. We take a fabulous train trip to Oslo and then spend 5-nights as guest of the Geo Norvegica Geopark to the south of Oslo. There we see a huge range of different rocks from Proterozoic gneisses to fossiliferous Palaeozoic sediments to the home of Larvikite the famous decorative facia stone.
View the brochure at our website - get the booking form from us!
We can accommodate a couple more people, but hurry.

One of the highlights of the trip is a geological excursion on the Scenic Telemark Canal aboard a vintage boat. (Image: TripAdvisor)

Edinburgh and the Borders (7-nights) - June 10-17 £1095
The historic capital city of Edinburgh and its environs represent one of the cradles of geology. Back in the 1780s, James Hutton and other members of Scottish Enlightenment, toured the area on Horseback and by boat making amazing geological discoveries.

From our comfortable hotel base in Dunbar we'll take in Hutton's Section, Hutton's Rock, Arthur's Seat volcano and the amazing Siccar Point - and they are just for starters! We'll also take in sites on the Firth of Forth and over in Fife as well as the Southern Uplands.
View the brochure at our website - get the booking form from us!
This trip is approaching being full, early booking is advised.

The famous Siccar Point the 'holy grail' of geological time. (Image: Colin MacFadyen)

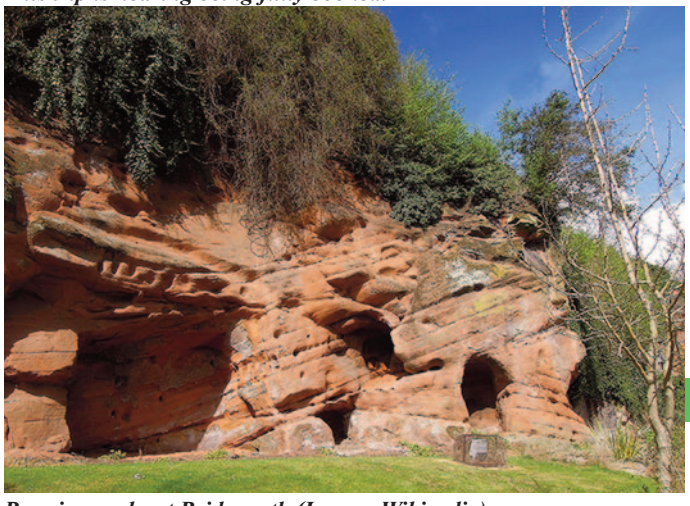
Welcome to our real world!

The Gower area of South Wales (7-nights) - June 23-30 £1195
This is an exciting new area for us with excellent geology covering mainly the Devonian and Carboniferous with amazing structures and fossils. We'll be going down the Big Pit coalmine and hopefully seeing some reptilian footprints! This is a great area that we will be covering for the first time.
Brochure available online - booking form from us. We can accommodate more people in twin and double rooms.

The Seabank Hotel - our comfortable base in Porthcawl, from where we can access all our field localities.

The Welsh Borderland (5-nights) - July 7-12 £895
The English county of Shropshire and the adjacent parts of Wales provide us with some of the most varied geology in the entire UK. We will be sampling rocks from the Precambrian right through to the Triassic with just about everything in between! There will be igneous plutonic and volcanic rocks, sediments galore and maybe even the odd metamorphic rock! There are fossils and minerals too - indeed something for everybody.

If you've never been on a geological field trip before then this is definitely one for you, as well as for the seasoned attender! Based at a comfortable guesthouse in the historic town of Bridgnorth, we'll be travelling around the area, including a trip on the Severn Valley railway.
Brochure online - get the booking form from us.
This trip is nearing being fully booked.



Permian rocks at Bridgnorth (Image: Wikipedia)

Summer School, Stirling (7-nights) - August 10-17 £1295
This will be the first time that we have taken our famous Summer School north of the border to Scotland. What better place could we have chosen than Stirling with its highly rated university set in a historic town with an ancient castle sat on top of a massive sill?

With all the usual elements that go together to make a great Summer School experience we'll bring you great geology with trips and study sessions combined with an enjoyable social experience. Accommodation is in en-suite single and shared rooms in modern student flats.
You can book this trip online via our website www.goesupplies.co.uk

Onion skin weathering of dolerite in Stirling
(Image: Open University Geological Society)

The Llyn Peninsula (5-nights) - August 31-September 5 £995
The Llyn Peninsula of North Wales is a very special place, where Welsh is the first language of most of its inhabitants and we enjoy local hospitality at its very best at the Nanhoran Hotel in Nefyn. Some of the geology is similar to that seen on Anglesey, but with lots of added extras! We see elements of an ophiolite complex, some excellent Cambrian sediments along with rare intrusives such as diorites. A highlight of this trip is a steam train ride on the Welsh Highland railway that takes in some of the magnificent scenery of Snowdonia, viewed at a slow pace from the comfort of your train seat. See the scenery of North Wales from a wholly different perspective
See the brochure online - get the booking form from us.

The Llyn Mélange with its amazing blocks.
(Image: Geology Wales)

The Channel Island of Jersey (7-nights) - September 21-28 £1250
With Guernsey visited in October of this year, it seems only logical to follow it up with Jersey in 2024. Jersey is the more popular of the two large Channel Isles and although close to Guernsey on the map, its geology is quite different. There are lots of late Precambrian volcanic rocks from the Brioverian, as well as later intrusive rocks. These combine to give us lots of interesting coastal sections.

To complete the geology, there are some excellent Quaternary sediments that give us an insight into the more recent history of the island.
Take a look at the brochure online and get the booking form from us. This trip is nearly full.

The Fort William area (10-nights) - October 4-14 £1595
This is one of the undoubted highlights of the entire year. We've gone to the max to bring you a comprehensive 10-night itinerary based in this iconic Highland locality, at the comfortable Croit Anna Hotel.

We'll be taking in the local geology of Glen Nevis, the volcanics of Glencoe the slates of Ballachulish and also more distant places such as Mallaig and Ardnamurchan. The trip will also include an excursion by boat on Loch Linnhe and a steam train trip to Mallaig aboard the famous Jacobite train which crosses Glenfinnan viaduct. Don't let the Autumn date of this trip put you off!
See the brochure online - get the booking form from us.

Fabulous geology of the Lochaber Geopark.
(Image: Lochaber Geopark)

The Yorkshire Dales (5-nights) - October 21-26 £895
Amazingly, we've never managed to base one of our trips in the Yorkshire Dales National Park. We had planned this trip for 2020, but it never happened due to Covid. Our base for the week is the small village of Gargrave, just to the west of Skipton. From here we'll take in some of the highlights of the National Park, including the ancient rocks of Ingleton and Horton in Ribblesdale, the magnificent Carboniferous limestone with its show caves and the younger rocks of the Yoredales and the Coal Measures. It's the perfect way to end our field season.
See the brochure online, get the booking form from us!
There's plenty of availability on this trip.

If you would like some help or advice before making a booking, we'd be delighted to talk with you - either pick up the phone or email us. All prices quoted above are per person in a shared room.

To get a booking form, email us at:
downtoearth@geosupplies.co.uk or ring us on: 0114 245 5746

Zoom courses for this Winter...

All of our Winter courses are up and running, but you can still join us as they all operate with different subjects each week, so you can join in with individual sessions. Just pay for the sessions you want, when you want! All of the Zoom sessions last for an hour, at a cost of £10.00 each (£15.00 for 2 people sharing a computer screen) including background materials and online Moodle support.

Geology and landscapes of the Geoparks of the UK
This course covers all the areas of the UK that are currently designated as UNESCO Geoparks, plus two other Geoparks that are outside that network. In short, some of the finest geology and landscapes of the British Isles. ***Live Zoom sessions are at 14.00 and 19.00 on Mondays.***

February 12	**English Riviera (Devon)**
February 19	**Abberley & Malvern Hills**
February 26	**Cuilcagh Lakelands (Northern Ireland)**
March 4	**North Pennines**
March 11	**Shetland Isles**
March 18	**Black Country (West Midlands)**
March 25	**Mourne Gullion Strangford (Northern Ireland)**

World geological adventures!
This course examines the geology of a number of places around the world. Some will be places that you are familiar with, whilst others will probably not be so familiar. All have a fascinating story to tell!
Live Zoom sessions are at 14.00 on Tuesdays.

February 13	**Canary Islands**
February 20	**Cyprus**
February 27	**The Rockies**
March 5	**New Zealand**
March 12	**Grand Canyon**
March 19	**Montserrat & the Caribbean**
March 26	**Antarctica. (New!)**

Evening talks at 7.00...

A series of evening talks with background notes. Live Zoom sessions accompanied by emailed background notes.

Live Zoom sessions are at 19.00 on Wedsnesdays.
Cost: £10.00 each, or £15.00 for 2 people sharing a computer screen, and are suitable for anyone with an interest in geology.

Winter Series

January 31	***"Geology along the Settle-Carlisle railway"***
February 14	***"Icelandic volcanoes - the latest news'***
February 21	***"Gideon Mantell - the UK's dinosaur man"***
February 28	***"The South Pennine Mineral Field"***
March 6	***"The geology of Charnwood Forest"***
March 13	***"The rise and fall of a Lake District mine"***
March 20	***"The geology of the Isle of Rum"***
March 27	***"Mapping England & Wales with William Smith"***

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The attractive setting for the University Campus (Image: Stirling University)

Former opencast coal mine at Meadowhill

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- A couple of evening talks from visiting speakers
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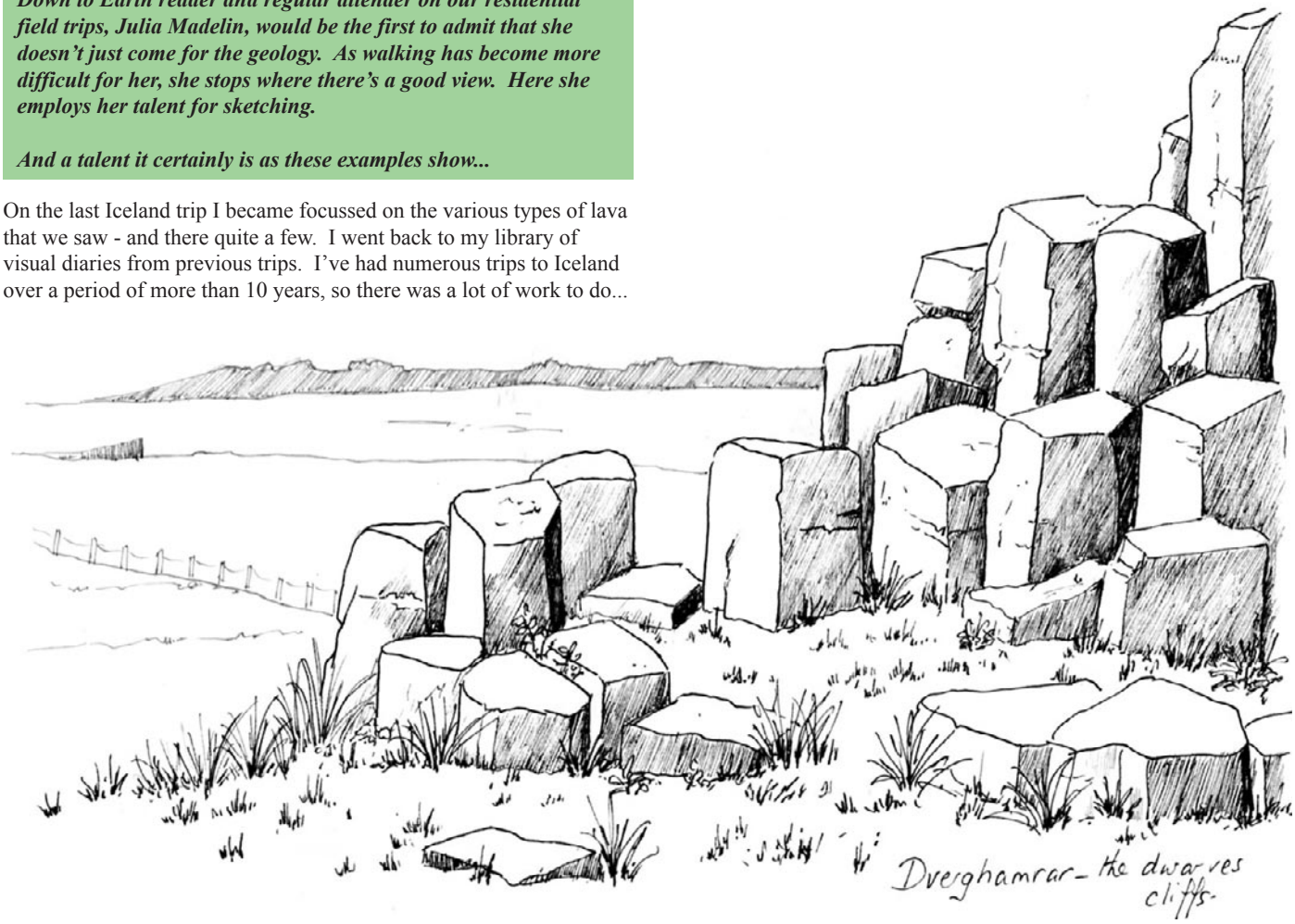
picture story

Another in our occasional series where we let the picture tell the story - well almost. Words and pictures by Julia Madelin.

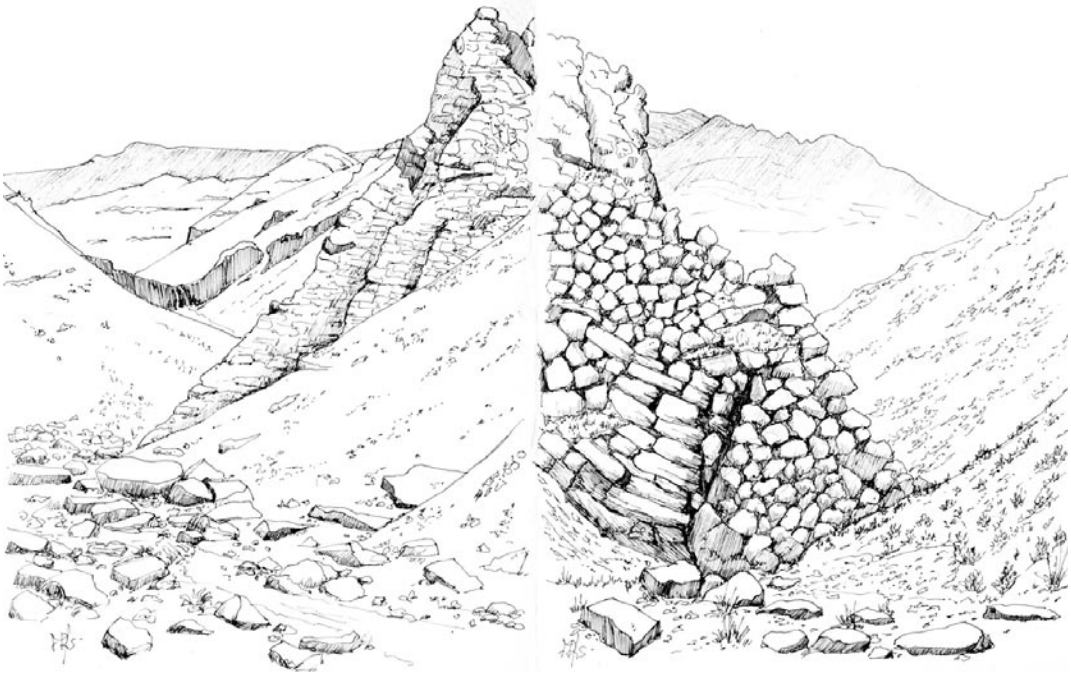
Down to Earth reader and regular attender on our residential field trips, Julia Madelin, would be the first to admit that she doesn't just come for the geology. As walking has become more difficult for her, she stops where there's a good view. Here she employs her talent for sketching.

And a talent it certainly is as these examples show...

On the last Iceland trip I became focussed on the various types of lava that we saw - and there quite a few. I went back to my library of visual diaries from previous trips. I've had numerous trips to Iceland over a period of more than 10 years, so there was a lot of work to do...



How about these for large large basalt columns! This is Dverghamrar, on the southeast coastal road. Sketched in 2012.



Two views of the same dyke intersecting a landscape formed in rhyolite. This is Njardvik in the north of Iceland.

It's interesting to see how different they are front and back.

Sketched on two different visits in 2012 and 2013.

This oil painting resulted from a magazine photograph of the Bardabunga/Holubraun eruption in 2014/15. I did a lot of similar paintings during the worst of the pandemic.

This is aa lava, from a very brief sketch on the Reykjanes Peneinsula last March. No structure in this type of rock at all, and it is generally very dark when fresh but does weather quite nicely. Quite quickly it gets a thick covering of moss, silvery when dry but greenish from Spring into the Summer. Even the aa we saw on the Westman Islands was well mossed after only 50 years.

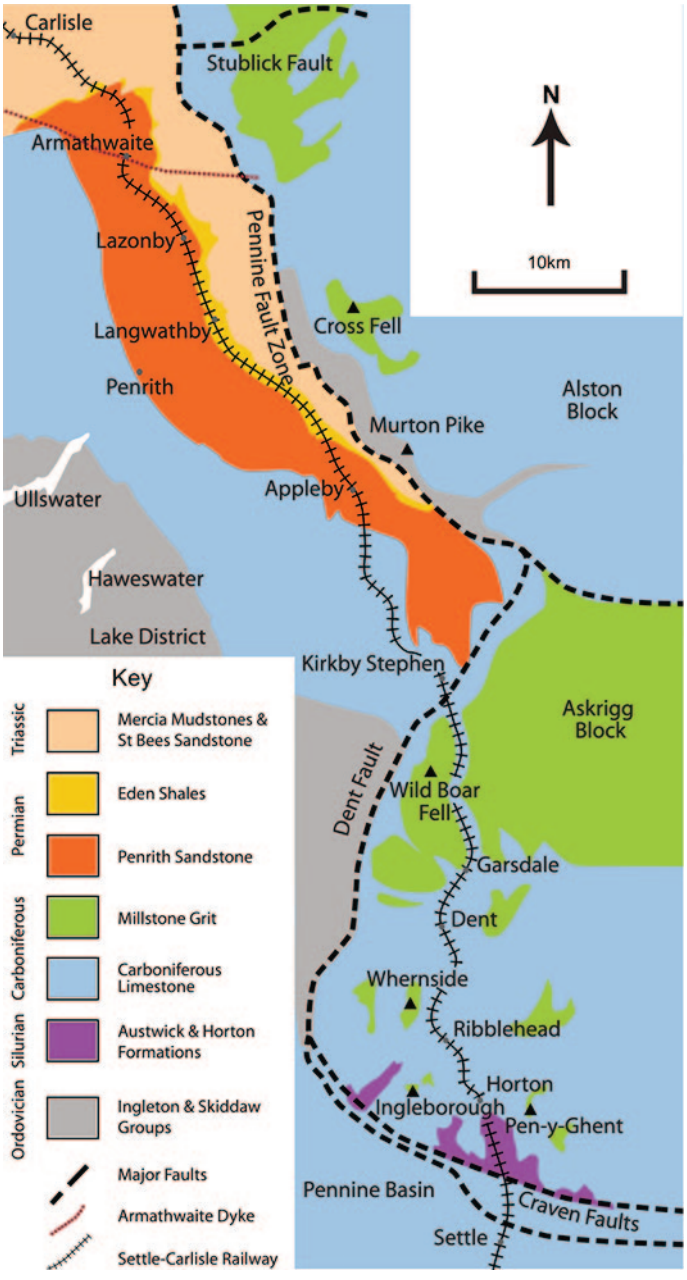
backyard geology

This is the place where we feature the stories that you tell us about geological happenings in your local area. Email your story to: downtoearth@geosupplies.co.uk

Geology of the Settle-Carlisle railway

Don't you just love it when you're doing some online research and up pops a publication that you had no idea existed? Your Editor was doing just that recently for an evening talk when he discovered this publication, that had been produced by the University of Leeds for the Friends of the Settle-Carlisle Line.

It's a 20-page A5 booklet in full colour that can be printed out for you to use. If you are planning to travel on this historic line it's your perfect geological companion.



The geological map (Image: University of Leeds)

It covers the section from Settle to Carlisle, so if you're travelling from Leeds or Skipton, you'll have to fill in that part for yourself. Onwards from Settle it covers each of the sections; Settle to Ribblehead, Ribblehead to Garsdale, Garsdale to Appleby, Appleby to Lazonby and Lazonby to Carlisle. There are also a section covering the economic geology and for those new to geology an outline of the geological history and an excellent map.

The way it's set out it would not be so easy to use the guide for a journey from Cariole down to Settle. Perhaps one day they will do one for the reverse journey. That said, you can use it to look out for the things you missed on the way up. Just a word by way of a suggestion, use this guide in conjunction with a decent topographic map, it will help you to pick out the hills and other physical features along the way.

A guide such as this would be great for a number of other routes, such as the East Coast mainline between Newcastle, Edinburgh and Aberdeen, not to mention the lines from Fort William to Mallaig or Inverness to Kyle of Lochalsh.

Download your guide here:

https://www.foscl.org.uk/sites/1/files/drupal/doc/attachments/GEOLOGY%209388-Settle-Carlisle%20Booklet3.pdf

The Whin Sill where you've probably never seen it before...

With the named storms that we've been enduring over the last few months, we've heard from several of you with news of how your local coastline has been affected.

Sand has been stripped from a number of East Coast beaches, revealing the underlying bedrock that may not have seen the light of day for many a long year.

Down to Earth reader Lawrence Heslop sent us this picture, in the days between Christmas and New Year. This is what he said:

"The Great Whin Sill underlies about four and a half thousand square kilometres of Northern England roughly east of the Eden Valley and north of the Upper Lunedale/Stainmore axis.

This quartz dolerite sill was intruded into Carboniferous strata during the earliest of Permian times. Here the wave smoothed sill outcrops on the sands of Embleton beach. To the south, the outline of Dunstanburgh Castle standing on a platform of Whin Sill can be observed. Construction of which began in 1315 using the local materials of limestone, sandstone and whin stone. Quoting Sir Nikolaus Pevsner: "The guant ruins of Dunstanburgh on their dolerite promontory are one of the most moving sights of Northumberland".

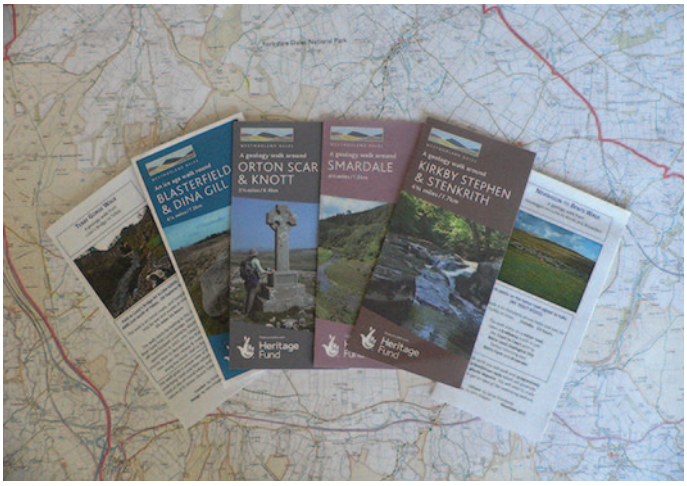
I took this late December photo on a morning of rain which suddenly changed to a sunlit sky that enhanced the glistening beauty of this geological and historic coastal setting.

This amazing picture has the properties of a painting, very evocative (Image: Lawrence Heslop)

New leaflets from Cumbria GeoConservation...

As you will have seen from an article by Sylvia Woodhead elsewhere in this issue of ***Down to Earth***, Cumbria GeoConservation is a very active voluntary group across Cumbria.

It has recently published ***"Revealing the Foundations"*** which concentrates on the little known Westmorland Dales. But it also has a number of leaflets covering a range of geotrails across Cumbria.



To see the full range go to: https://www.cbdc.org.uk/cumbria_geoconservation/geotrails/

South Petherton, a story of springs...

We recently did an evening talk about the geology of UK Spa towns. This spurred on ***Down to Earth*** reader Elizabeth Randall to research her own home area, South Petherton in Somerset.

The water flows orange through this ford at South Petherton.

There's a small stream that still flows - whatever the weather - fed by several springs on the edge of the slight valley filled with modern alluvium. Where the stream is forded, it was marked on the 1887 map as 'The Springs (chalybeate)'. I wonder if local people called it this, or whether the Victorian Ordnance Surveyors took the liberty of naming it so because they were aware of public interest in springs?

The water at the ford stains the road bright orange, presumably from very iron-rich water. I have looked at the geology map and surmise that water must have percolated through the (Lower Jurassic) iron-rich Yeovil Sands and Junction Bed (recently renamed Beacon Limestone) and been trapped on the mudstones and marls of the top of Pennard Sands. The stream follows a fault where older Beacon Limestone and Pennard Sands on the east side are faulted up relative to the younger Yeovil (Bridport) Sands on the west of the fault.

your feedback

Tell the Editor what you think about any geological subject or article in DtoE
Email: downtoearth@geosupplies.co.uk
or write to him at the usual address

Dear Editor

Response to James Dent, DtoE 125

I was very dismayed to read James Dent's letter in ***DtoE 125 (November 2023)***.

Of course we know that CO_2 concentrations and climatic conditions have varied enormously through geological time, but this totally misses the point. It is surely uncontroversial that vast quantities of fossil fuels have been burnt since the beginning of the Industrial Revolution, that a major product of this is CO_2, and that CO_2 levels have risen steadily (by nearly 50%) over that period.

That CO_2 is a potent greenhouse gas is basic physical chemistry. So perhaps James Dent could explain how these emissions have not caused global warming. Moreover, the current rate of warming greatly exceeds those estimated for most major climatic events in the past, including several associated with mass extinctions. I suggest that, before pontificating about "media fabrications", Mr Dent does some serious homework. His understanding of the overwhelming scientific evidence supporting anthropogenic climate change is clearly less than adequate.

Incidentally, some years ago I discovered that a few of my former geological colleagues at the Australian Geological Survey Organisation (now Geoscience Australia), and very competent geologists at that, also considered that current climate change is merely due to natural variations. I suppose it is just too easy for geologists, with their knowledge of Earth history, to assume this, but that isn't science, it's just laziness.

John Sheraton, St Briavels

Hi Chris

Re: Greetham Quarry photo DtoE 125

The image of Greetham Quarry is wrongly labelled. The excavator is quarrying Lincolnshire Limestone (LLst). You can see the face below it. I don't know how thick the LLst. is here, but it is up to 20 metres thick a few miles south at Ketton, a quarry I know well, where it is the principal raw material for cement manufacture. The upper part of the LLst. may be oolitic, the famous Ketton freestone, but it looks grotty and much iron-stained in the photo, and may not be present at Greetham. It is the only limestone suitable for aggregate and, as you can see, not all of it. Some does make excellent building stone though.

The upper limestone, just below the topsoil, is Blisworth Limestone, a very shelly limestone which fractures easily and is not much use for anything except as a raw material component for cement manufacture.

Between them is the Rutland Formation, a predominantly non-marine silty formation with about six erosion surfaces within it, each truncating rootlets. Some horizons are almost coal. Within it is a calcareous oyster bioherm, which stands out as a brown horizon in the photo. The Rutland Formation (RF) forms part of the raw material recipe for cement manufacture at Ketton. As far as Greetham Quarry is concerned the RF is probably waste.

Out of sight beneath the Lincolnshire Limestone is the Grantham Formation (up to 2m thick at Ketton), which consists of non-marine silts with rootlets, and beneath that the marine Northampton Sand Ironstone, which is oolitic in its upper part. It is a few metres thick and rests unconformably on the Lias. The Northampton Sand Ironstone provided the ore for about 40% of UK home-produced iron during WW2. The Lias forms much of the floor of nearby Rutland Water, where the ichthyosaur was found.

Peter del Strother

Dear Chris

David Attenborough TV documentary

I watched the recent documentary about the finding of the Pliosaur in Dorset and found it fascinating, But it didn't occur to me that the chap who found the Pliosaur snout had barely been mentioned.

There's a link in ***The Guardian*** article to a Change.org petition asking that the Pliosaur be named after him and I wondered if you might either like to support it or maybe even circulate it.

https://www.theguardian.com/media/2024/jan/03/calls-for-dinosaur-attenborough-and-the-giant-sea-monster-to-be-named-after-amateur-fossil-hunter-bbc

Sally Dulieu

Dear Chris

'Rest and be Thankful' DtoE 125

I was amazed to see your image in DtoE 125, as I was retained as a hydrologist with the UK Met Office (2005-2010), and was involved in projects dealing with severe storms and flooding in Scotland. Following a major incident at 'Rest and be Thankful' in 2003, when two landslips trapped several vehicles on the Pass, UKMO was engaged to assist Transport for Scotland in devising a monitoring and forecasting of severe precipitation and landslips at the site. Because of the localised focus of the forecast, and the remote, upland nature of the site, the use of weather radar was not feasible.

On previous studies involving slope stability, it had been found that antecedent rainfall quantities over several weeks was an indicator for potential landslips, should a heavy rainfall event subsequently occur. Some form of highly reliable remote sensing, continuous, interrogable rainfall measurement was required. A reliable power supply would be essential, but as protracted land purchase negotiations meant that I had moved on, I do not know what final arrangement were put in place.

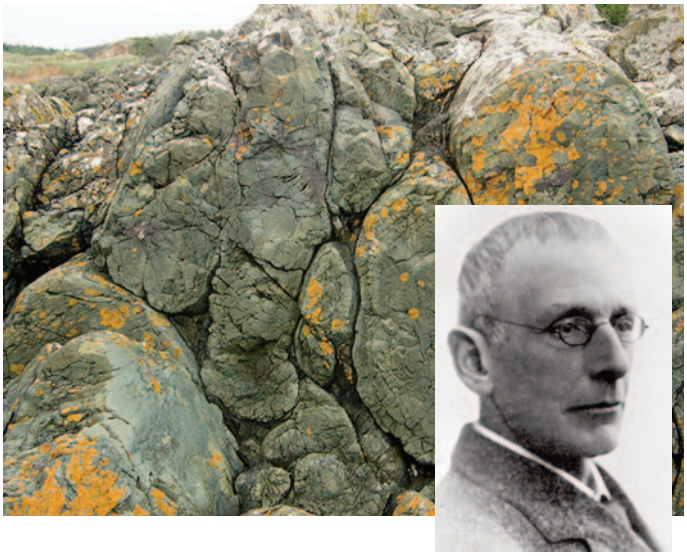
It would be interesting to learn if any early warning system was in place for the last event. The occurrence of such an event serves to emphasise that extreme weather and ground conditions are an inherent part of mountain environments, however much we consider that these areas are perceived as a big theme park.

James Dent

brainteaser

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

Who, What & Where?



We hope that you enjoyed our little brainteaser! Thank you to the people who responded - you were both correct.

So here's the answers:

What?	*The picture shows basaltic pillow lavas.*
Where?	*It's Newborough Warren, on Anglesey*
Who?	*Edward Greenly, geologist*

Edward Greenly carried out a detailed geological survey of Anglesey in the early years of the twentieth century.

Greenly's mapping was so good that it still forms the basis of the current geological map from BGS. He identified all the major rock types on the island, including some that were pretty unique to Anglesey.

He named one exotic rock unit the 'mélange' because it resembled the literal meaning 'a varied mixture'. In this case the mixture includes rocks that can be up to 100m in length. We now know that it can only have been emplaced as a result of tectonic processes in a subduction zone.

Examination of the basalts in the picture from Newborough Warren shows that the pillows have been turned vertically with the top of each pillow being towards the right. We come to this conclusion because each pillow can be seen to drape over the pillow below. This is considered to be seafloor material from at least 500 million years ago, somewhere near to the Precambrian/Cambrian boundary.

Edward Greenly's Anglesey Map (Image: The Geological Society)

Edward Greenly, was an extremely talented geologist (1861-1951) who rose to become President of the Geological Society.

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

Once again, we're giving you a person, from the image someone from the nineteenth century, and a famous geological site, linked to that person.

We just want to know Who, What and Where? There's no prizes, but we'd love to hear from you.

Please contact us before April 15th.

Field image courtesy of the Geological Society.

a good read

Reviewer: Chris Darmon

Book Choice

Title: Revealing the Foundations
Author: Elizabeth Pickett
Publisher: Cumbria GeoConservation
ISBN: 978 1 3999 6777 8
Format: Softback
Cost: £10.00
Level: Adult & general interest
My rating: *****

This new booklet manages to bring together the essential ingredients that, taken together, enable the public to enjoy geology and landscape in a specific local area. Those ingredients are: a local landscape with a story to tell, an author who can put that story into words and the funding necessary to make it happen. For good measure, add in a local voluntary organisation to drive the project forward, in this case Cumbria GeoConservation.

If you aren't familiar with the local geography, the Westmorland Dales are situated in the northeast corner of Cumbria where it butts up against the Yorkshire Dales. This area has now been incorporated within the wider Yorkshire Dales National Park. It's good that thanks to sponsorship from the National Lottery and the Yorkshire Dales National Park Sustainable Development Fund its geological story can now be told.

The thing that stuck me immediately about this book is how it is so beautifully illustrated. It has excellent colour photographs throughout along with a superb map, cross sections and diagrams. The designers are to be congratulated on making the booklet so inviting and inclusive. Nowhere do you feel overwhelmed by printed information. This is a booklet that everyone can embrace and enjoy.

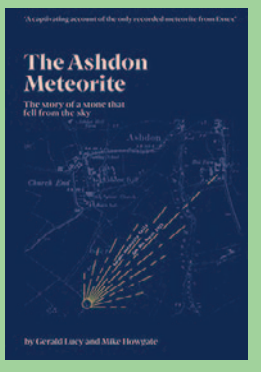
As you might expect, the story is told in the order in which the rocks were laid down. In this case, the oldest rocks are sediments from the Silurian that were lad down in Iapetus Ocean, that was lost in the Acadian Orogeny. To help people grasp this long lost world, there's a handy globe to show the continental positions at the time. Around the same time the Howgill Fells, also formed from Windermere Group rocks, were uplifted.

Next up is the emplacement of the Shap Granite around the end of the Silurian. It's linked to other granites of similar age across northern England. The rare Devonian rocks north of Tebay are mentioned and their desert environment also explained.

The Carboniferous rocks and their different landscapes are given the space and explanations they deserve. After all this is the rocks people naturally associate with the dales, whether in Yorkshire or Westmorland. Limestone country, with its caves and karst is such an iconic part of the area. Rocks from the deserts of the Permian and Triassic in the Eden Valley are explained.

Focus also falls onto the glacial aspects of the Quaternary which have been key to the landscape we see today. All in all this is a great story and the 'big reveal' is indeed the landscape we can see today. This little booklet is a triumph in story telling - well done!

Book Choice



Title: The Ashdon Meteorite
Authors: Gerald Lucy & Mike Howgate
Publisher: Essex Rock & Mineral Society
ISBN: 978 1 9996757 4 5
Format: Softback
Cost: £5.00
Level: Adult general interest

Think for a moment how the media would handle the story today. A meteorite falls from the sky and lands in a wheat field, in broad daylight, close to the village of Ashdon in Essex. To this day it's the only meteorite to be recorded as landing in Essex.

Back on March 9th. 1923, we didn't have widespread access to radio let alone TV or social media. They relied on an eye witness, and there was one, 36-year old Frederick Pratt, a thatcher.

The story of the meteorite wasn't big news at the time. Indeed nobody seems to have made a fuss and it was some three days later when Frederick and another worker form the estate recovered the meteorite. Not knowing what to do next, he took it to the local police station and then to the vicar in nearby Wendens Ambo. The vicar, Francis Berry, bought it off Frederick.

It seems that the meteorite was kept with Berry at the vicarage until he eventually contacted the Minerals Department at The Natural History Museum in London, where the Keeper was 60-year old George Price. Price was, at the time, Britain's foremost authority on the subject of meteorites. We can safely assume that until this time June 1923, he had been unaware of the Ashdon meteorite.

Shortly before his visit to the site on June 8th. Prior issued a press release and several of the national newspapers, including ***The Times***, picked up on the story and especially the fact that it had been witnessed by Frederick.

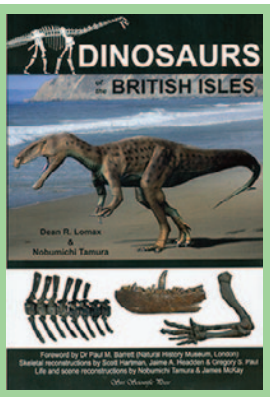
Now, slightly more than a hundred years on from this amazing event, we can look back at how different things would be now, were that to happen today. It would be all over social media within minutes. The 24 hour news channels would splash the news around the world. Or would they? Would such an event warrant any coverage beyond the very local area?

Gerald Lucy and Mike Howgate have done an amazing job with this booklet. they have clearly researched contemporary accounts of the finding and done some 'digging' of their own. The result is a really informative and also quite a gripping account of an historic event.

They go from the specifics of the Ashdon Meteorite to describe what meteorites are and how they fit into the solar system. By way of contrast they talk about the 2021 Winchcombe Meteorite that fell in a garden in Gloucestershire.

This is an unusual publication that deserves to be read widely. It's a very good read!

Book Choice



Title: Dinosaurs of the British Isles
Authors: Dean Lomax & Nobumichi Tamura
Publisher: Siri Scientific Press
ISBN: 978 0 9574530 5 0
Format: Softback
Cost: £33.00
Level: Adult general interest
My rating: *****

I'm sorry that we have not reviewed this book before, but it came along with several other Siri Scientific Press tiles and somehow didn't get the ***Down to Earth*** treatment until now.

There are a lot of books about dinosaurs and, to be honest, they are of variable quality. Almost all of them claim to be something special, and few are. In this country, as opposed to the USA, there are just a handful of people who could write a competent book all about dinosaurs, let alone dinosaurs of the British Isles exclusively.

I'm pleased to say that this book is co-authored by Dean Lomax, who I have a lot of respect for and Nobumichi Tamura who is new to me, but who is well known in the USA for his impressive illustrations of dinosaurs.

Dean has been passionate about dinosaurs since he was a child and is largely self taught. He now holds a PhD and is a visiting scientist at the University of Doncaster. He has worked on a number of UK vertebrate finds, including the Rutland Water ichthyosaur in 2022.

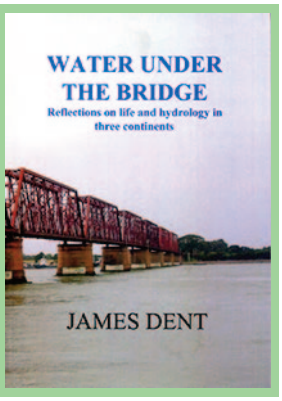
This book can justifiably claim to be unique, as it provides the first comprehensive account of the plethora of dinosaurs that have been found in the British Isles, over the last 200 years. It's hard to realise that the very first dinosaur was found by the Rev. William Buckland in the 1820s and it was Sir Richard Owen who coined the term Dinosauria shortly afterwards.

Since then there's been a continuous thread of new discoveries across these islands. Even 30 years ago it would have been hard to think that Scotland's Isle of Skye would be termed a 'dinosaur isle', but with a number of finds under it's belt this is a justifiable accolade.

In recent years several museums have become dedicated to dinosaurs such as Dinosaur Isle on the Isle of Wight and the Oxford University Natural History Museum. There have also been a number of high profile finds which have grabbed our imagination.

This book is most definitely not a coffee table book that you can pick and put down after a 10-minute read. This a serious account of the dinosaurs of the British Isles, their taxonomy and how they fit into the bigger picture. That said it is superbly illustrated with photographs and reconstructions.

This book is a must - buy it, you won't be disappointed!



Title: Water Under the Bridge
Author: James Dent
Publisher: St Matthew Publishing
ISBN: 978 1 901 546 78 1
Format: Softback
Cost: £19.00
Level: Adult general interest
My rating: ****

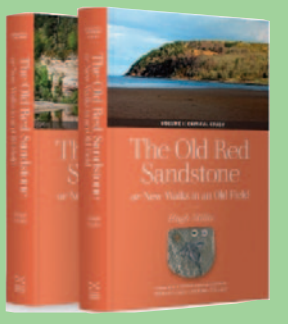
It's often said that there's a book in every one of us, but in many cases that would stem from our imagination rather than from our lives as lived through our work.

In the case of this author, James Dent it stems from a lifetime of work in and around bridges, working as a hydrologist across three continents. From studying for a geology degree at the University of Leicester between 1965 and 1968 he went on to enjoy a long and illustrious career. Beginning in the UK and then going on to work in Bangladesh and even Papua New Guinea.

As you'd expect from an autobiography this is a very personal book, written not by a polished writer, but with all the passion that comes from someone for whom hydrology and meteorology weren't just a job they were a passion.

Through these pages I see echoes of my own father who was working overseas at a similar time. In James I see many of my father's traits of concern for the welfare of people who were living very different lives to those enjoyed by British based professionals at the time. Through many examples we get to know how hydrologists work in the field, when access to equipment and engineering solutions wasn't as it would be back here in Britain.

To purchase the book, contact: dent650@btinternet.com



Title: The Old Red Sandstone or New Walks in an Old Field
Author: Hugh Miller
Publisher: National Museums Scotland
ISBN: 978 1 910682 25 8
Format: Softback
Cost: £30.00 the pair
Level: Adult & general interest
My rating: ****

This set of two books about Hugh Miller's pioneering work on the Old Red Sandstone as facsimiles, were reviewed in ***DtoE 125, November 2023***.

Elsewhere in the issue we said that they had been nominated for a major literary award. We are delighted to report that they won for their publisher National Museums Scotland. At Scotland's National Book Awards it won The Saltire Society research book of the year award with the judges saying: "A critical study of Hugh Miller's nineteenth century geological writings, this two-volume set delivers a great deal of collective wisdom couched in impressively elegant prose."

diary of events

lectures/zoom meetings

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

February

1 "The geology of the Italian part of Lake Maggiore" by Tony Felski (Zoom)
Details: Hull Geol. Soc. Details: http://www.hullgeolsoc.co.uk/
1 "Reading the Sahara: NE Africa" by Ted Dubowski
Organiser: Bath Geol. Soc. Details: https://bathgeolsoc.org.uk/lectures/
5 "Maps, mountains & madness:Charles Lapworth & the Highland Controversy" by Paul Smith
Organiser: Reading Geol. Soc. Details: rgs.secretary@btinternet.com
6 "Crystal detectives: tracing magmatic processes through time" by Katy Chamberlain. Organiser: Liverpool Geol. Soc.
Details: https://liverpoolgeologicalsociety.org/indoor-meetings
6 "The rise ands fall of the British/Irish ice sheet of the last glacial" by Chris Clarke
Organiser: Essex Rock & Min. Soc. Details: http://www.erms.org/ (Shenfield)
7 "Exceptional fossils: the surprising, the significant and the strange" by Peter Sheldon
Organiser: Brighton & Hove Geol. Soc. Details: https://www.bhgs.org/
7 "Tipping positive change to avoid climate tipping points" by Tim Lenton
Organiser: Cumberland Geol. Soc.
Details: https://www.cumberland-geol-soc.org.uk/events/
8 "The Klondike Gold Rush" by Matt Cook
Organiser: Mole Valley Geol. Soc. Details: www.mvgs.org.uk
8 "The NW Highlands controversy" by Peter Gutteridge
Organiser: North Staffs. GA Group Details: https://nsgga.org/
8 "The Thames in Hertfordshire and adjacent areas" by David Bridgland
Organiser: Herts. Geol. Soc. Details: https://www.hertsgeolsoc.org.uk/talks/
9 "What did the last ice age do for us? Scotland during the last ice age" by Emrys Phillips
Organiser: Farnham Geol. Soc. Details: www.farnhamgeosoc.org.uk/meetings/
10 "The legacy of coal mining" by Jeremy Hucker
Organiser: South Wales GA Group. Details: http://swga.org.uk/
10 "Diamond geology" by Tony Waltham
Organiser: East Midlands Geol. Soc. Details: www.emgs.org.uk
12 "Ediacaran fossils in Namibia" by Alex Liu
Organiser: Cambs. Geol. Soc. Details: http://www.cambsgeology.org/events
12 "The rise and fall of the British-Irish ice sheet" by Chris Clark
Organiser: Huddersfield Geol. Group.
Details: https://www.huddersfieldgeology.org.uk/talks/
13 "Sir Arthur Russell and his mineral collection" by Roy Starkey (Zoom)
Organiser: Amateur Geol. Soc. Details: www.amgeosoc.wordpress.com
14 "Darwin and the Ice Age in Shrewsbury" by Mike Streetly
Organiser: Shropshire Geol. Soc.
Details: http://www.shropshiregeology.org.uk/SGS/SGSintro.html
14 "Lorna's Seeds Urban Mining Project: phytomining of nanoparticles" by Lorna Anguilano
Organiser: Harrow & Hillingdon Geol. Soc. Details: contact@hhgs.org.uk
15 "Native metals in minerals and rocks" by Alistair Rickards
Organiser: Essex Rock & Min. Soc. Details: http://www.erms.org/ (Stanway)
15 "Geology and caves of northern Greenland" by Paul Smith
Organiser: Warwickshire Geocons. Group Details: http://www.wgcg.co.uk/
16 "Fluid flow in orogenic belts" by Catriona Menzies (Zoom)
Organiser: North Eastern Geol. Soc. Details: https://www.negs.org.uk/
16 AGM plus talks - show and tell
Organiser: West Sussex Geol. Soc. Details: http://www.wsgs.org
17 "The Gavellachs" by David Tyler + Presidential Address
Organiser: Manchester Geol. Ass. Details: lectures@mangeolassoc.org.uk
17 Minerals, rocks & fossils workshop - identifying specimens
Organiser: Warwickshire Geocons. Group Details: http://www.wgcg.co.uk/
19 "A very British summer in the Late Triassic" by Stuart Burley
Organiser: Black Country Geol. Soc. Details: honsec@bcgs.info
20 "Iceland" by Hazel Clark. Organiser: Liverpool Geol. Soc.
Details: https://liverpoolgeologicalsociety.org/indoor-meetings
20 "The 2022 eruption of the Tonga volcano" by Doreen van Seenus
Organiser: Kent Geologists' Group Details: www.kgg.org.uk/
21 President's Address by Hugh Tuffen Organiser: Westmorland Geol. Soc.
Details: https://www.westmorlandgeolsoc.co.uk/winterlectures
21 "Exotic mineral phases from the Skye ejecta layer - further evidence of a bollide impact" by Andy Beard
Organiser: Essex Rock & Min. Soc. Details: http://www.erms.org/ (Zoom)
22 Fossil focus seminar (Zoom)
Details: Hull Geol. Soc. Details: http://www.hullgeolsoc.co.uk/
27 "Nuclear waste disposal" by Josh Griffiths & Nick Smith
Organiser: Liverpool Geol. Soc.
Details: https://liverpoolgeologicalsociety.org/indoor-meetings
28 "Worms and wonders: Silurian £D soft-bodied fossils" by Mark Sutton
Organiser: Manchester Geol. Ass. Details: lectures@mangeolassoc.org.uk

March

4 Presidential address by Alison MacLeod, University of Reading
Organiser: Reading Geol. Soc. Details: rgs.secretary@btinternet.com
5 "The secret life of starfish" by Aaron Hunter
Organiser: Essex Rock & Min. Soc. Details: http://www.erms.org/ (Shenfield)
5 "The magnetic evolution of the Þingmuli Central Volcano, East Fjords, Iceland" by Amanda Hughes Organiser: Liverpool Geol. Soc.
Details: https://liverpoolgeologicalsociety.org/indoor-meetings
6 "Engineering geology for offshore wind farms" by David Shilston
Organiser: Brighton & Hove Geol. Soc. Details: https://www.bhgs.org/
6 Volcanology talk by Lydia Whittaker
Organiser: Manchester Geol. Ass. Details: lectures@mangeolassoc.org.uk
7 "Volcanoes and life in extreme environments" by Sam Mitchell
Organiser: Bath Geol. Soc. Details: https://bathgeolsoc.org.uk/lectures/
7 Fossil focus seminar (Zoom)
Details: Hull Geol. Soc. Details: http://www.hullgeolsoc.co.uk/
8 "Glacial history of Deeside" by Stuart Archer
Organiser: Farnham Geol. Soc. Details: www.farnhamgeosoc.org.uk/meetings/
9 "Geology of Stonehenge and the Bluestone controversy" by Peter Worsley
Organiser: East Midlands Geol. Soc. Details: www.emgs.org.uk
11 "The interpretation of the periglacial land system through LiDAR" by David Giles
Organiser: Cambs. Geol. Soc. Details: http://www.cambsgeology.org/events
11 "Carboniferous amphibians" by Rebecca Bennion
Organiser: Huddersfield Geol. Group.
Details: https://www.huddersfieldgeology.org.uk/talkso
12 "Soil, or geology with worms" by Ian & Ros Mercer
Organiser: Amateur Geol. Soc. Details: www.amgeosoc.wordpress.com
12 "Geothermal energy" by Ian Stimpson
Organiser: Shropshire Geol. Soc.
Details: http://www.shropshiregeology.org.uk/SGS/SGSintro.html
12 "Water pollution in the Philippines" by Emma Biles
Organiser: Liverpool Geol. Soc.
Details: https://liverpoolgeologicalsociety.org/indoor-meetings
13 "Sarsen stones - it's not all about Stonehenge" by Keith Whitaker
Organiser: Essex Rock & Min. Soc. Details: http://www.erms.org/ (Zoom)
13 Presentation by Ian Jackson. Organiser: Cumberland Geol. Soc.
Details: https://www.cumberland-geol-soc.org.uk/events/
14 "Structural history of southern England - nothing to do with the Alps?" by Andy Gale
Organiser: Mole Valley Geol. Soc. Details: www.mvgs.org.uk
15 "The Palaeozoic geology of northwest France" by Dave West
Organiser: West Sussex Geol. Soc. Details: http://www.wsgs.org
15 "Going down the drain: water quality in a changing climate" by Julia Knapp
Organiser: North Eastern Geol. Soc. Details: https://www.negs.org.uk/
16 "Probably the best Lagerstatten in the world" by John Nudds
Organiser: South Wales GA Group. Details: http://swga.org.uk/
19 "In pursuit of the Classis Britannica" by Lynn Cornwell
Organiser: Kent Geologists' Group Details: www.kgg.org.uk/
20 "Shear genius: soft sediments, shear zones and how glaciers move" by Emrys Phillips. Organiser: Westmorland Geol. Soc.
Details: https://www.westmorlandgeolsoc.co.uk/winterlectures
21 "Coastal sea level change" by Julian Andrews
Organiser: Essex Rock & Min. Soc. Details: http://www.erms.org/ (Stanway)

21 "Charnwood (Ediacaran) fossils" by Frankie Dunn
Organiser: Warwickshire Geocons. Group Details: http://www.wgcg.co.uk/
21 "Sediments and climate change" by Rhodri Jerrett
Organiser: Manchester Geol. Ass. Details: lectures@mangeolassoc.org.uk

April
2 "Serpentine and the Lizard geology" by John Warmsley & Ros Mercer
Organiser: Essex Rock & Min. Soc. Details: http://www.erms.org/ (Shenfield)
3 "UVB radiation was the terrestrial killer at the Devonian'Carboniferous boundary" by John Marshall
Organiser: Brighton & Hove Geol. Soc. Details: https://www.bhgs.org/
4 "Fluid flow, carbon capture and storage" by Jonathan Bull
Organiser: Bath Geol. Soc. Details: https://bathgeolsoc.org.uk/lectures/
8 "Mountains in the sea" by Tony Watts
Organiser: Reading Geol. Soc. Details: rgs.secretary@btinternet.com
8 "Lincolnshire ironstones how they helped to shape the county" by Paul Hildreth Organiser: Huddersfield Geol. Group.
Details: https://www.huddersfieldgeology.org.uk/talks/
9 "The mineralogy of art" by Chris Duffin
Organiser: Amateur Geol. Soc. Details: www.amgeosoc.wordpress.com
11 "A model Phanerozoic sea level curve with application to the Guyana Suriname Basin" by Douwe van der Meer
Organiser: Herts. Geol. Soc. Details: https://www.hertsgeolsoc.org.uk/talks/
13 Members' talks
Organiser: Cambs. Geol. Soc. Details: http://www.cambsgeology.org/events
13 "The Lower Cretaceous East Lindsey Group - a jewel in the geological crown of Lincolnshire" by Paul Hildreth
Organiser: East Midlands Geol. Soc. Details: www.emgs.org.uk
14 "Jade - from Neolithic value to crypto exchanges" by Kevin Foo
Organiser: Mole Valley Geol. Soc. Details: www.mvgs.org.uk
15 "Geology of the Chiltern Hills: new data and new interpretation" by Haydon Bailey
Organiser: Black Country Geol. Soc. Details: honsec@bcgs.info
16 "Forensic geology Part 2" by Geoff Turner
Organiser: Kent Geologists' Group Details: www.kgg.org.uk/
17 "Regionally-extensive ejecta layer of the Australasian tektite strewn-field: the MIS 20 large meteorite impact in Indochina" by Paul Carling
Organiser: Westmorland Geol. Soc.
Details: https://www.westmorlandgeolsoc.co.uk/winterlectures
18 "The role of dynamic fluid processes during Mississippi Valley Type mineralisation" by Paul Dennis
Organiser: Essex Rock & Min. Soc. Details: http://www.erms.org/ (Stanway)
18 "Wolstonian Glaciation & HS2" by Phil Gibbard & Seb Gibson
Organiser: Warwickshire Geocons. Group Details: http://www.wgcg.co.uk/
19 "Evaporites and the Sussex Gypsum Mines" by David Alderton
Organiser: West Sussex Geol. Soc. Details: http://www.wsgs.org
24 "Women in geology" by Bev Fowlston
Organiser: Essex Rock & Min. Soc. Details: http://www.erms.org/ (Zoom)

day field trips & visits

Please ensure that you contact the organisers in advance of any field trip advertised. Please don't just turn up. In some instances field trips may be limited to members only - please enquire.

February
10 Geoconservation day at Wrens Nest National Nature Reserve
Organiser: Black Country Geol. Soc. Details: honsec@bcgs.info
10 Browns Folly, Great Oolite SSSI Nature Reserve
Organiser: Bath Geol. Soc. Details: https://bathgeolsoc.org.uk/lectures/
24 Lesnes Abbey woods and the Thames Barrier with Alison Barraclough
Organiser: Reading Geol. Soc. Details: rgs.secretary@btinternet.com

March
9 Geoconservation day at Saltwells National Nature Reserve
Organiser: Black Country Geol. Soc. Details: honsec@bcgs.info
9 Field visit to Newhay Quarry, Lancashire with Oldham Geol. Soc.
Organiser: Huddersfield Geol. Group.
Details: https://www.huddersfieldgeology.org.uk/talks/
10 The Corallian of Oxfordshire with Owen Green
Organiser: Reading Geol. Soc. Details: rgs.secretary@btinternet.com

April
6 Field visit to Castleton with Albert Benghiat
Organiser: Black Country Geol. Soc. Details: honsec@bcgs.info
17 Martley, Worcestershire with Ian Fairchild
Organiser: Reading Geol. Soc. Details: rgs.secretary@btinternet.com
20 Field exposures in Crummackdale with Ailsa Burrows
Organiser: Huddersfield Geol. Group.
Details: https://www.huddersfieldgeology.org.uk/talks/
21 A geowalk from Newbiggin-on-Lune to Bents and Brownber with Sylvia Woodhead. Organiser: Westmorland Geol. Soc.
22 "The geology of UK Spa towns" by Chris Darmon (Zoom)
Organiser: Teme Valley Geol. Soc.
Details: https://earthheritagetrust.org/teme-valley-geological-society/
Details: https://www.westmorlandgeolsoc.co.uk/summerfieldtrips
26 Field visit to Flamborough Head with Mike Horne
Details: Hull Geol. Soc. Details: http://www.hullgeolsoc.co.uk/
27 Lavernock & St Mary's Well Bay with Maurice Tucker
Organiser: Bath Geol. Soc. Details: https://bathgeolsoc.org.uk/lectures/

residential field trips

2024
April
10-18 The Northwest Highlands of Scotland with Chris Darmon & Colin Schofield
Organiser: Down to Earth Details: downtoearth@geosupplies.co.uk
24-May 3 Southern Norway with Chris Darmon & Colin Schofield
Organiser: Down to Earth Details: downtoearth@geosupplies.co.uk

May
10-12 The Peak District with Martin Whiteley
Organiser: West Sussex Geol. Soc. Details: http://www.wsgs.org
16-19. Purbeck & Portland with Ross Garden
Organiser: Reading Geol. Soc. Details: rgs.secretary@btinternet.com

June
10-17 Edinburgh and the Scottish Borders with Chris Darmon & Colin Schofield
Organiser: Down to Earth Details: downtoearth@geosupplies.co.uk
23-30 The Gower Coast of South Wales with Chris Darmon & Colin Schofield
Organiser: Down to Earth Details: downtoearth@geosupplies.co.uk

July
7-12 The Welsh Borderland with Chris Darmon & Colin Schofield
Organiser: Down to Earth Details: downtoearth@geosupplies.co.uk

August
10-17 Annual Summer School at Stirling with the team
Organiser: Down to Earth Details: downtoearth@geosupplies.co.uk
31- Sept. 5 the Llyn Peninsula with Chris Darmon & Colin Schofield
Organiser: Down to Earth Details: downtoearth@geosupplies.co.uk

September
9-12 Shropshire with Albert Benghiat
Organiser: Reading Geol. Soc. Details: rgs.secretary@btinternet.com
21-28 The Island of Jersey with Chris Darmon & Colin Schofield
Organiser: Down to Earth Details: downtoearth@geosupplies.co.uk

October
4-14 The Fort William area with Chris Darmon & Colin Schofield
Organiser: Down to Earth Details: downtoearth@geosupplies.co.uk
21-26 The Yorkshire Dales with Chris Darmon & Colin Schofield
Organiser: Down to Earth Details: downtoearth@geosupplies.co.uk

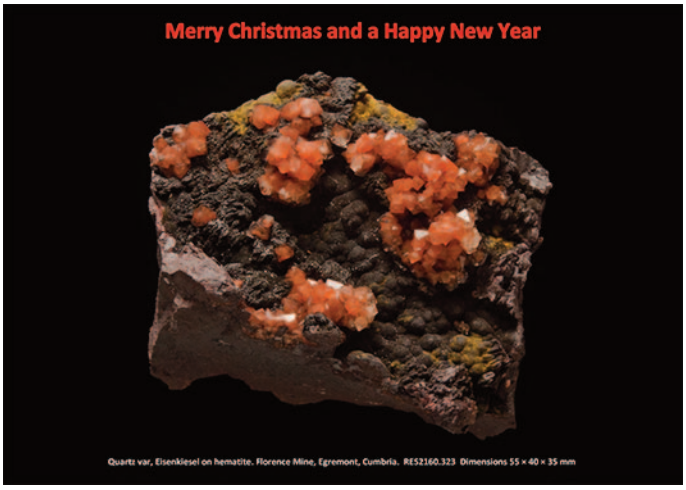
fairs, shows & special events

February
5-22. Uxbridge Rock Show - en exhibition in Uxbridge Library. Free admission, open during library hours.
Organiser: Harrow & Hillingdon Geol. Soc. Details: contact@hhgs.org.uk

pygidium

Our regular little 'tail-pieces' of information some serious, others light. If you've found something - share it with us all.

Roy's famous Christmas card...



Every Christmas mineralogist, and author Roy Starkey sends out a suitable e-card and 2023 was no exception. If you're finding the text a little too small to read, this is what it says...

"Quartz var, Eisenkiesel on hematite. Florence Mine, Egremont, Cumbria. RES2160.323 Dimensions 55 × 40 × 35 mm"

If you are liking what you see, why not check out some of Roy's excellent UK mineral books.

No, it's not part of wartime defences...

You could be forgiven for thinking that this concrete ruin on the coast of the Isle of Man was just another bit of wartime junk left behind from either World War 1 or 2, but you'd be wrong.

In the 1890s, whilst drilling in search of coal, a brine lake was located underground and the Manx Salt & Alkali Company was set up in 1901. For a few years, during the early 20th Century, brine was pumped and salt extracted at Ayre Point. This is the remains of the operation.

This is taken from Culture Vannin:

"This solution of concentrated salt water was so pure that it was pumped down to Ramsey to be evaporated for use as table salt and as a preservative for the thriving herring industry. Parts of the original pipe that carried the brine can still be seen on the beach near Cranstal."

The site of the salt works, after it was abandoned. This image dates from the 1920s. (Image: Manx Museum)

A group of Down to Earth readers visited the site in September last year in the company of Cheshire based geologist Ros Todhunter, who along with Juan Cunliffe, carried out a review of the geology and the operations in 2021. This document is lodged with the Manx Museum.

'No more fossils' - no we're not talking to you...

At the COP28 meeting and ever since one of the main placards being waved around by protesters reads 'no more fossils', referring, of course to the ongoing use of fossil fuels, such as coal, oil and gas.

Not wishing to pass up an opportunity to speak on behalf of our silent and long lost fossil friends, I'd be tempted to turn up with my own placard reading 'fossil festival'- as per the example from Lyme Regis!

Fossil Festival
Lyme Regis

Is this something that sounds familiar...

We recently got this from a Down to Earth reader, who will remain anonymous - but does it ring bells for you?

"I was "Moodle-ing yesterday evening when my computer decided to throw a wobbly and turn itself off. As this was the fifth in a succession of mechanical items misbehaving I decided to finish my book instead."

What's the saying never work with animals, children and tech?

A new logo for you...

Those of you who join us in geological jaunts may not be familiar with the fact that we also run residential trips for geologists on the other side of the Atlantic Ocean.

In 2024 we've got an 11-night trip that takes a grand tour around Scotland and then in 2025 we're running a week based in Cornwall. In both cases this is for members of the American Institute of Professional Geologists (AIPG). They are great groups of people, often accompanied by their partners and even their children!

Greetings from Brighton & Hove Geological Society...

It's always nice that at the end of the year we hear from some of you who express their pleasure at having had another year of ***Down to Earth*** copies.

We also like seeing your geological pictures, like this of the fine chalk cliffs at Seven Sisters in West Sussex from Brighton & Hove Geological Society. Thank you!

Iceland's 'journey to the centre of the Earth'...

Jules Verne's "Journey to the centre of the Earth" may be fictional, but Iceland has set it's sites on at least drilling into a magma chamber. Press reports in early January 2024 pint to an experimental bore into the Krafla Volcano in the northeast of the country.

This comes from phys.org:
"With its large crater lake of turquoise water, plumes of smoke and sulphurous bubbling of mud and gases, the Krafla volcano is one of Iceland's most awe-inspiring natural wonders.

Here, in the country's northeast, a team of international researchers is preparing to drill two kilometres (1.2 miles) into the heart of the volcano, a Jules Verne-like project aimed at creating the world's first underground magma observatory.

Krafla Volcano is in the remote northeast of Iceland. (Image: Courtesy of phys.org)

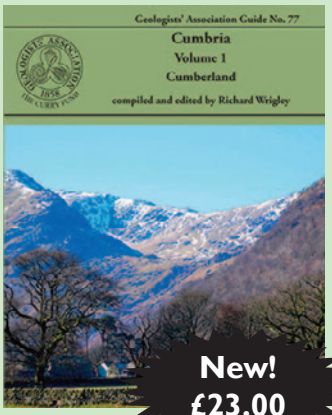
Launched in 2014 and with the first drilling due to start in 2024, the $100-million project involves scientists and engineers from 38 research institutes and companies in 11 countries, including the US, Britain and France. The "Krafla Magma Testbed" (KMT) team hopes to drill into the volcano's magma chamber. Unlike the lava spewed above ground, the molten rock beneath the surface is a mystery."

Whilst Icelandic geologists are keen to add to our scientific knowledge they also see a possible commercial aspect to their work, especially what is called 'super hot rock geothermal' which could be great for power production.

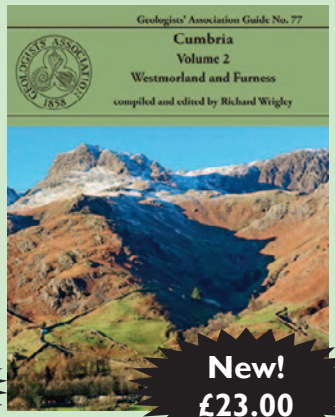
Beer & geology, you can't have one without the other...

GEO Featured books February to April

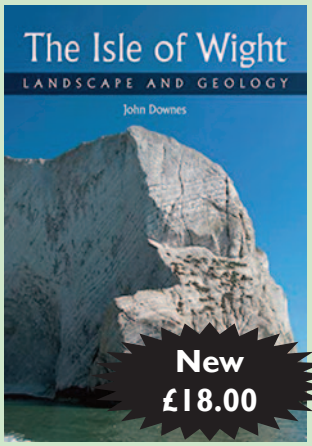
In each issue we are pleased to be able to introduce you to a range of featured books. Where they are being offered at reduced prices, these will be current to the end of April 2024 provided that stocks are available. Please note, all prices include UK postage.



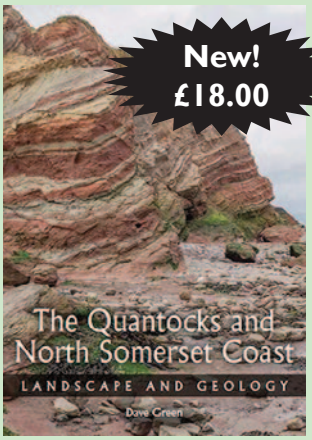
New! £23.00



New! £23.00

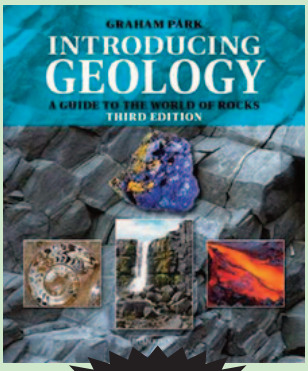


New £18.00

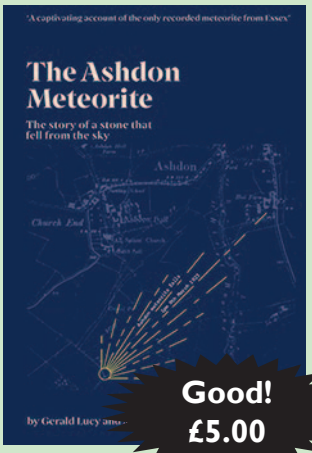


New! £18.00

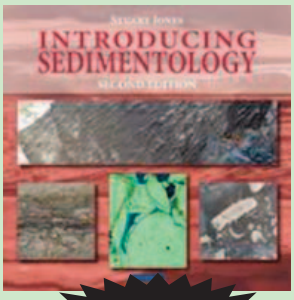
New! £10.00



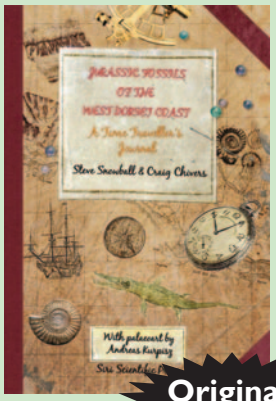
New Ed! £11.00



Good! £5.00



New Ed. £16.00



Original! £18.00

Great! £37.00

New! £13.00

Superb! £30.00

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