BATH GEOLOGICAL SOCIETY

2023 was an active year, the COVID-19 pandemic largely behind. The Society met virtually during the winter months (Nov 2022 to Feb 2023) and meet physically between March and October 2023 This document records the Newsletters which we produced to engage with members throughout 2023.

January 2023

- January Lecture advert– David M Hall
- February Lecture advert – Prof. Atle Nesje
- Notice of AGM and Agenda

March 2023

- April Lecturea dvert – Prof. Mike Benton
- Riches of the Earth Exhibition BRLSI
- Geology from your Sofa – Bath GS contribution
- Drilling into the Lias beneath Bath – by Maurice Tucker
- Down to Earth Extra – Turkey/Syria earthquake

April 2023

- May Lecture advert – Members talks
- Field Trip advert – Penarth and Sully – Maurice Tucker
- Geo-miscellanea – The earliest geological map by David Hall
- Riches of the Earth Exhibition BRLSI

May 2023

- June Lecture advert – Mark Howson
- Field Trip advert Portishead – Mark Howson
- Field Trip advert - Marlborough Downs – Prof. Peter Worsley
- Geo-miscellanea – a lake delta on Mars by David Hall

June 2023

- July Lecture advert – Dr Chris Berry
- Field Trip advert - Marlborough Downs – Prof. Peter Worsley.
- Request for specimens - Gavin Gillmore Museum of Bath Ston
- Geo-miscellanea – Geology in the News – MauriceTucker

July 2023

- September Lecture advert – Tony Roberts
- Field Trip advert – Cleeve Hill – Nick Chidlaw
- What happened here – a geological photo riddle – Charles Hiscock
- Geo-miscellanea – The case of the vertical ammonite – Maurice Tucker

September 2023

- September Lecture advert – Tony Roberts
- Field Trip advert – Woolverton – Simon Carpenter
- Field Trip advert – Cleeve Hill – Nick Chidlaw
- What happened here – a geological photo riddle- Solved! Charles Hiscock
- Advert- GA Festival of Geology on Nov 4th 2023

October 2023

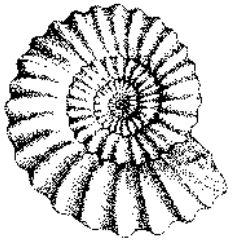
- October Lecture advert – Dr. Danny Clark-Lowes
- Field Trip advert – Cleeve Hill – Nick Chidlaw
- Upcoming GA Festival of Geology on Nov 4th 2023
- Mendip Rocks Festival

November 2023

- December Lecture Advert – Dr. Peter Gutteridge
- Winter Social advert -
- Report back on Festival of Geology 2023
- Report back on Cleeve Hill Field Trip Oct.

http://www.bathgeolsoc.org.uk

Bath Geological Society Newsletter January 2023



I would like to start by wishing everyone a happy and prosperous New Year. I would like to thank you for your continued support of the Bath Geological Society. If you haven't already renewed your membership for 2023, I would encourage you to do so, details are available on page 5.

During the winter months we have returned to holding the monthly lectures on Zoom only. We plan to return to BRLSI in Bath for the April 2023 lecture. Given the lack of face-to-face meeting we decided to hold a **'Winter Social'** at the New Inn pub, in Bath, on December 15th. This was a lively and enjoyable evening as our visit coincided with an Open Mic event at the pub and we were entertained by live music. Those who attended suggested we should also hold a 'Summer Social'.

During November and December, the Society held two zoom lectures; On November 3rd 2022, **Dr David Buchs** from the University of Cardiff spoke to us about the **Formation of the Isthmus Panama**. On December 1st 2022 **Professor Maurice Tucker** spoke to us about the ancient city of **Petra and the stories in its rocks**. A recording of Maurice's talk was made and is available to watch in the members area of our website.

By now you should have received the **2022 Journal of the Bath Geological Society.** (A full-resolution version is available via this link) I would like to thank **Mell Freeman** for her huge efforts in editing and producing the journal and also to all those who contributed articles. If you see something inspiring to write about, please do so, and send your articles to Mell. journal@bathgeolsoc.org.uk it can be the first article for the next 2023 Journal!

The next zoom lecture will be on Thursday January 19th 2023, **David M. Hall** will be speaking to us about the **Geology of Yemen**. David is one of our own members and recently led a field trip for us. On February 2nd 2023 our zoom lecture will be given by **Professor Atle Nesje** of the University of Bergen. He will be giving it from Norway, his topic will be **'The Briksdalsbreen glacier and the Jostedalsbreen ice cap in the past, present, and future'**.

Following the February lecture, we will hold our AGM. We are looking for two volunteers to join the committee, the positions of Chair and Field Secretary need to be filled. If you are interested in helping to run the Bath Geological Society, we would love to hear from you.

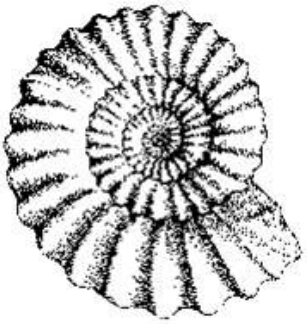
Graham Hickman

chairman@bathgeolsoc.org.uk

In this issue:

Bath Geological Society lecture
Thursday January 19th 2023 @7:00pm

Title: 'Geology of Yemen – an Overview'
Speaker: David M. Hall
Bath Geological Society & SulGeology Ltd.



Abstract: The topographic and surface geological maps of Yemen show that it is a country of contrasts. To illustrate this, the mainland area can be subdivided into five main regions: The highland region, the fluvially dissected plateau, the flat coastal Plain of the Red Sea rift basin, the rift margin of the Gulf of Aden and the desert areas including the southern margin of the great Rub' Al Khali sand sea.

The sub-surface provides even more geological interest as stripping back the sedimentary cover reveals at least three major Mesozoic rift basins two of which are proven hydrocarbon provinces. The complex internal fault geometry of these basins reflects the inheritance of Precambrian (and possibly Palaeozoic) lineaments and results in a mosaic of fault-bounded depocenters that probably also extend beneath the volcanic areas in the west of the country.

This talk will provide an overview of the geological history responsible for these characteristics and will also assess the past and future significance of the country's hydrocarbon resources. A particular focus will be given to fractured Precambrian basement hydrocarbon play which has been a subject of active involvement for the speaker since 2013. The potential for geothermal resources will also be mentioned.

David M. Hall was the Yemen geoscience and exploration manager for TOTAL from 2013 to his retirement in late 2018. Since then, he has been an independent consultant to the PetroMasilah Exploration and Production Company for their on-going activities in Yemen.

This will be a Zoom lecture

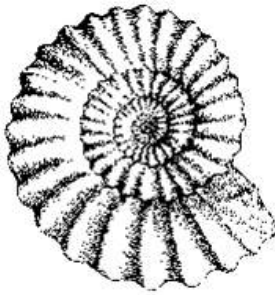
Lectures are **free to members**. We will email the joining instructions and the Zoom meeting info to members.

£5 donation is requested from non-members and visitors via Eventbrite.

Get Tickets

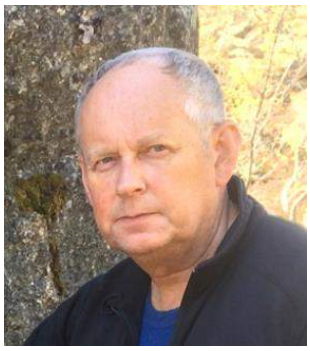
https://www.eventbrite.co.uk/e/geology-of-yemen-an-overview-tickets-500025237947

Bath Geological Society lecture
Thursday February 2nd @7:00pm



Title: 'The Briksdalsbreen glacier and the Jostedalsbreen ice cap in the past, present, and future'

Speaker: Professor Atle Nesje of the University of Bergen, Norway.



Abstract: The first part of the talk will deal with describing past changes of the Briksdalsbreen outlet glacier from the Jostedalsbreen ice cap, the largest ice cap on mainland Europe. The second part of the talk will be spent on presenting evidence of the size variations of the entire Jostedalsbreen ice cap during the last 11,000 years, after the termination of the last ice age. Finally, an estimate of what may happen with Norwegian glaciers in a future climate will be presented.

This will be a Zoom lecture

Lectures are **free to members**. We will email the joining instructions and the Zoom meeting info to members.

£5 donation is requested from non-members and visitors via Eventbrite.

Get Tickets

https://www.eventbrite.co.uk/e/the-briksdalsbreen-glacier-and-jostedalsbreen-ice-caps-tickets-510106822237

BATH GEOLOGICAL SOCIETY

Dear Member,
For the third year running we have decided to go ahead and hold the AGM virtually using Zoom. It will be held at 8pm on Feb 2nd 2023, following the February lecture. The Zoom details for the AGM will be the same as for the lecture.

FIFTY THIRD ANNUAL GENERAL MEETING

Thursday 2nd February, 2023 at 8.00 p.m.

Via ZOOM

AGENDA

1. Apologies for absence
2. Minutes of the 2022 Annual General Meeting
3. Matters arising
4. Chairman's Report
5. Treasurer's Report
6. Election of Officers
7. Any other business
8. Date of next Annual General Meeting – Thursday 1st February, 2024

In order to facilitate the AGM, we will be emailing members the documents and reports you would normally receive at the meeting ahead of time.

I hope to see as many of you as can attend on 2nd Feb 2023

Best Regards

Graham Hickman

chairman@bathgeolsoc.org.uk

Bath Geological Society Membership - 2023

It's time to pay your membership fee for the new year!

As ever, we have a varied and exciting programme of lectures and guided trips to look forward to, including a field trip concerning dinosaur footprints. More details will be available soon!

The membership fees for the full year from January to December 2023 are:

Individual: £30

Family: £45

Student: £15

The easiest way of renewing your membership is via the website at;

https://bathgeolsoc.org.uk/membership.html

If you prefer, you can complete the standing order form from the download button at the bottom of the webpage and hand it to one of the Committee at one of our meetings, or post to the below address.

You can make a bank transfer using the details below.

Account name: Bath Geological Society

Sort code: 40-09-19

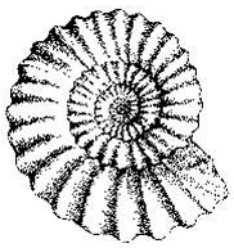
Account number: 71262556

Reference: BGS / [Your name]

Alternatively, you can post your cheque along with your membership form to the membership secretary: Ms Katie Munday, The Membership Secretary, 6 Lymore Terrace, Bath, BA2 2JL, or bring your cheque or cash payment with you to the next meeting at BRLSI.

On behalf of the Committee may I thank you for your support and we look forward to meeting with you again.

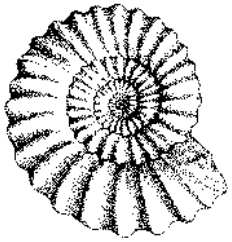
Best wishes,



Katie Munday

membership@bathgeolsoc.org.uk
Bath Geological Society Membership Secretary

Bath Geological Society Newsletter March 2023



Despite some snow fall at the begining of March, spring is on its way! There are signs everywhere that winter is ending and with that a return to face to face meetings for the Bath Geological Society. As we return to BRLSI, there is also the opportunity to the Riches of the Earth mineral exhibition - starting on Saturday April 1st and running until October. (see page 3 for further details)

Our next meeting will take place on **Thursday April 6th 2023** at 7:30pm in BRLSI, Queen Square, Bath. Our speaker will be **Professor Mike Benton** from Bristol University. He will be talking about **Extinctions: How Life Survived, Adapted and Evolved**. This will be a hybrid lecture so those unable to attend can join on Zoom. For those who can make it in person we are planning some celebratory drinks and snacks following the lecture.

During January, February and March, the Society held three zoom lectures; In January David M. Hall spoke to us about the Geology of Yemen, an area he has worked on for many years. David is one of our own members and recently led a field trip for us. In February we held our first Zoom lecture with an overseas speaker Professor Atle Nesje of the University of Bergen spoke to us about the Briksdalsbreen glacier and the shrinking ice cap. In March Prof. Ian Fairchild spoke to us about the Anthropocene.

The 2022 Journal of the Bath Geological Society has received good feedback and we are now looking for items for the 2023 edition. If you see something inspiring to write about, please do so, and send your articles to Mell. journal@bathgeolsoc.org.uk it can be the first article for the next 2023 Journal!

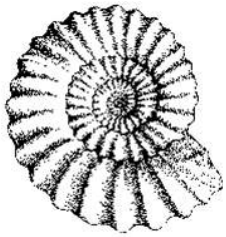
We also held the AGM in March, following the lecture. Members discussed the hybrid lecture program and provided positive feedback, they are especially enjoyed by those living further afield. The consensus was that we are going to continue them. We are looking for two volunteers to join the committee, the positions of Chair and Field Secretary need to be filled. If you are interested in helping to run the Bath Geological Society, we would love to hear from you.

I would like to thank you for your continued support of the Bath Geological Society. If you haven't already renewed your membership for 2023, I would encourage you to do so, details are available on page 5. Graham Hickman

chairman@bathgeolsoc.org.uk

In this issue:

Bath Geological Society lecture
Thursday April 6th @7:30pm



Title: 'Extinctions: How Life Survived, Adapted and Evolved'

Speaker: Professor Mike Benton, University of Bristol.

Abstract: Palaeontology shows us that many billions of species that once existed are now extinct, and their natural extinctions enabled new species to inherit the Earth. We identify mass extinctions during which 50–95% of species were killed off, and yet life always recovered. In fact, some of the great diversifications in the history of life were triggered by the opportunities afforded by mass extinctions. So, extinction in the context of modern life, especially the needless slaughter of species by human action or carelessness, is inexcusable. Who does not mourn the loss of the Polynesian tree snail or the dodo? Palaeontologists of course work on longer time scales and can see how extinction events have released the potential of new groups to show their evolutionary mettle. This is one of the wonders of exploring the geological record but should not allow us to think we can hasten the extinction of any modern species.

Please note: this will be a hybrid lecture – it will take place in person at BRLSI, Queen Square Bath, BA1 2HN, but will also be broadcast via Zoom for those unable to join us in person. As it will be the first of our face-to-face lectures in 2023, please join us for a celebratory drink and snacks following the lecture.

Lectures are **free to members**. We will email the joining instructions and the Zoom meeting info to members. £5 donation is requested from non-members and visitors via Eventbrite.

Get Tickets

https://www.eventbrite.co.uk/e/extinctions-how-life-survived-adapted-and-evolved-tickets-583102835277

Riches of the Earth

Free Exhibit @ BRLSI, Queen Square Bath.

Sat 1 April 10:00 am - Sat 7 October 4:00 pm BST

Free exhibition: Queen Square, Bath

This exhibition runs from **Saturday April 1st to Saturday October 7th 2023, 10am to 4pm every day except Sundays.**

Riches of the Earth reveals the beauty of minerals through the astounding forms and vibrant colours of more than a hundred carefully selected specimens from the Bath Royal Literary and Scientific Institution Collection.

Alongside these, exquisite close-up photographs will allow visitors to appreciate tiny details of crystal form and colour. The marvellous colours and forms of these natural wonders will delight the viewer: glacial blue-green beryl, rainbow-hued opal, fiery red heulandite, lurid yellow sulphur, along with hexagonal prisms of aragonite, eccentrically fused cubes of fluorite, and needle-like crystals of Goethite.

Link:

https://www.brlsi.org/whatson/riches-of-the-earth-the-beauty-of-minerals/?mc_cid=7deb73e2e3&mc_eid=5202693778

Geology from your Sofa

A new look GFYS for 2023

sofageology@geologistsassociation.org.uk

Geology from your Sofa (GFYS) is an initiative from the Geologists' Association (GA), it came about as a direct response to the COVID-19 pandemic 'lockdown' in March 2020. There was considerable concern that the GA, in common with local and affiliated groups, was cancelling or postponing all forthcoming lectures, activities and field trips. Aware that such measures would have implications for members' general wellbeing and ability to take part in anything geological, it was proposed that details of current on-line courses and lectures, in addition to virtual field trips, were made available on the GA website.

The first edition of GFYS became available on 21 April 2020. GA Members received a MailChimp notification of this, and several affiliated and local groups immediately sent details of GFYS to their members. GFYS was extremely well received, with numerous comments, observations and feedback about specific events which had been attended.

Some of the most popular GFYS listings have been Nick Zentner's 'Nick from Home 'YouTube lectures, on-line courses provided by FutureLearn and the virtual field trips available on the Cumbria Biodiversity Data Centre's website. A fourth category, 'Geofun' was later added to GFYS a month later and includes the adventures of Mini Jurassic girl and The Rock Showman.

During much of 2020 and 2021 updates of GFYS were sent out every two weeks with new content and information added on the GA website. During the winter of 2021-22 the GFYS issues followed the themes of the Geological Periods. However as the COVID-19 pandemic restrictions were lifted it was decided to halt the fortnightly issue and instead start a new initiative for 2023. It was decided to ask the local and affiliated groups to Adopt a monthly issue. So far this has had a strong uptake with a positive response from the Reading GS, Hertfordshire GS, Harrow and Hillingdon GS and our own **Bath Geological Society has contributed to the March 2023 edition.**

Bath Geological Society

on the theme: Made in Stone: Bath and Petra, 2 world heritage sites

https://geologistsassociation.org.uk/sofageology/

Drilling into the Lias beneath Bath City

By Prof. Maurice Tucker

There are many small and large construction projects underway in Bath these days, new housing and office developments, student residencies, infill buildings, etc., and these usually require some drilling by a geotechnical firm to determine the nature of the soil and rock below ground level. Samples are routinely collected for geotechnical testing. In the city area, drilling usually takes place to a depth of 10 to 15 metres. Keeping an eye on such activities on one's walks around the city frequently brings opportunities to see the bedrock beneath one's feet.

In the last month, there have been several sites along the river where drilling has been taking place and the geotechnical engineers there have been happy to show me the core samples they have recovered (Figure 1). In the area of the Upper Bristol Road near Victoria Bridge, drilling revealed up to 2 metres of made ground and below that 3 metres of loose sand and gravel, the relatively recent deposits of the River Avon. The material of the made ground is conspicuous for containing many whole and fragmented oyster shells. Oysters were a staple food in England, particularly enjoyed by the Romans and then through medieval times until the late Victorian age. Below these 5 metres of superficial material, bedrock is encountered; with drilling extended down to 15 metres in some wells.

In the lower reaches of Bath City, the immediate subsurface geology is the Lias, Lower Jurassic limestones and mudstones (see cross-section, Figure 2). Moving up the slopes from the town centre and Avon valley, up above the Upper and Lower Bristol roads, and the London and Warminster roads, the next stratal layer encountered is the Bridport (also called Midford) Sand, very rarely seen at outcrop. The succeeding unconformable Inferior Oolite, with some poor exposures, is seen towards the top of Beechen Cliff, just south of Bath Spa Station, and across Bath at Beacon Hill, above Camden Crecent; it also forms the Sion and Primrose hills.

Figure 1. Example of the cores recovered from recent drilling at a planned building site by the River Avon in Bath.

Core 1 shows 50 cm of river sediment, here 20 cm of brown mud overlying yellow-orange sand and gravel.

Cores 2 and 3 from separate wells both show the contact between the orangey river gravel and underlying dark grey Liassic mudstone.

Core 4 from 10 metres depth is 1.5 m long with several limestone beds (pale grey) interbedded with dark mudstone, a typical feature of the Blue Lias.

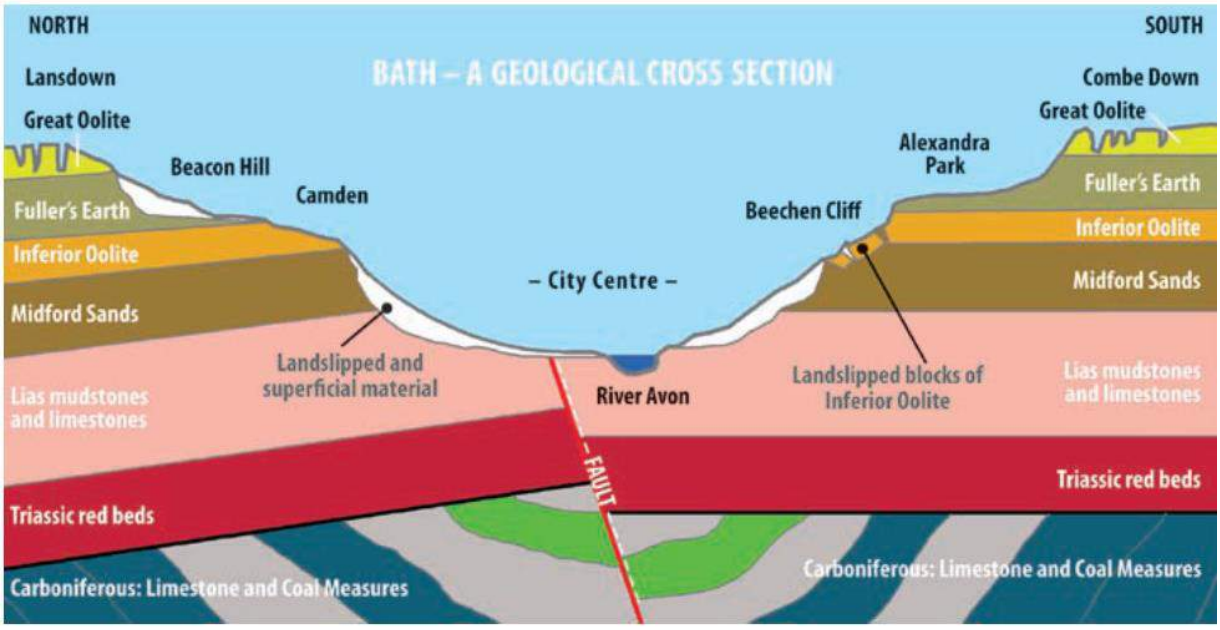


Figure 2. Cross-section from Lansdown across the Avon Valley and Bath City centre to Combe Down showing the stratigraphy and structure. From Tucker 2019 (Bath Magazine).

Cores examined from the drilling into these future building sites show very nicely the features of the Liassic limestones forming the solid basement below the low-lying areas of Bath. The Liassic is divided into 3 divisions: the Blue Lias (up to 40 m thick), the Charmouth Mudstone (up to 160 m) and the Bridport Sand (up to 60 m) at the top. The Blue Lias consists of fine-grained, medium to dark grey, clay- and organic-rich limestones alternating with dark grey mudrock (Figure 1, core 4).

Fossils are relatively common and include all the usual Lower Jurassic forms: ammonites, belemnites, bivalves, brachiopods, crinoidal debris and bones of marine reptiles (like ichthyosaur and plesiosaur vertebrae). However, in a 3-inch core of course, one will only see cross-sections so that in some cases a little imagination is required to work out what the fossil is!

The cores of the Blue Lias do show the presence of shells of bivalves and ammonites (Figures 3, 4).

Figure 3. Ammonite in cross-section on the outside of a core, 8 cm across.

The ammonite in Figure 4 is noteworthy since the interior of the shell is filled with a yellowish sediment – probably due to the presence of finely crystalline pyrite A cm wide vertical burrow can be seen to the left, slightly darker (from more organic matter) than the surrounding calcareous sediment. Also, within the fill of the ammonite shell there is also elongated mm-scale burrows filled with grey mud.

Figure 4. Cut surface of a Blue Lias limestone core (3cm across) showing cross-section of ammonite and burrows.

The other feature commonly seen in limestone is fracturing and jointing. Fractures are the result of dislocations in the strata, mostly attributed to tectonic activity such as folding and faulting. Jointing is in response to a regional stress pattern causing a limestone bed to break, commonly at right angles to the bedding with a regular spacing.

Joints commonly do not have minerals precipitated. However, the fractures in a limestone are usually filled with a white calcite cement, the result of fluids moving up through a developing fracture, dissolving limestone and reprecipitating calcite when supersaturation is reached. In the Bath city area, along the Avon Valley there are three east-west en-echelon faults affecting the strata; Newton Fault in the west, the Pennyquick Fault and the Kingsmead Fault which fades away near Bath Cricket Club / North Parade. The downthrow on these faults is to the south, although the throw is only a metre or less. The Kingsmead Fault in the city centre provides the conduit for the hot water feeding the springs for the Roman baths. Associated with fracturing in limestone there is commonly the precipitation of minerals other than calcite, especially the metal sulphide minerals, pyrite, galena and sphalerite, if the fluids are hydrothermal and derived from significant depth. Fluids coming from the underlying Carboniferous rocks are commonly rich in metals and they may well be reducing so that sulphides are precipitated. The cores from the Lias limestones do show calcite-filled veins with pyrite and galena (Figures 5, 6).

Figure 5. Core of thin limestone bed with a cm-wide fracture (Core 8 cm across.)

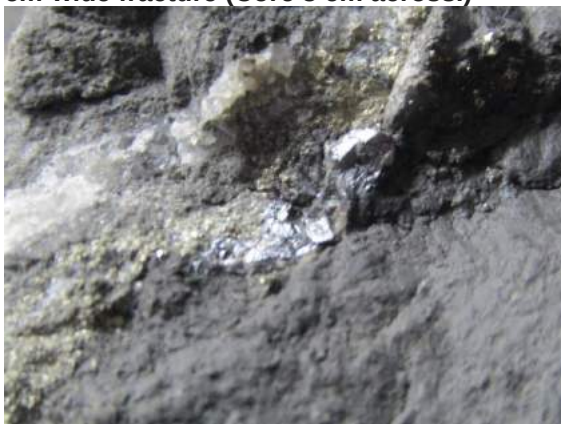


Figure 6. A fracture surface of a dark limestone with calcite (white) at top, pyrite (yellow/gold) and galena (silver). Field of view 3 cm.

If you come across any drilling taking place in the Bath area in connection with foundations and building work, I would be pleased to hear about it. There is always something of interest beneath the surface and invariably a story in the rocks retrieved by drilling.

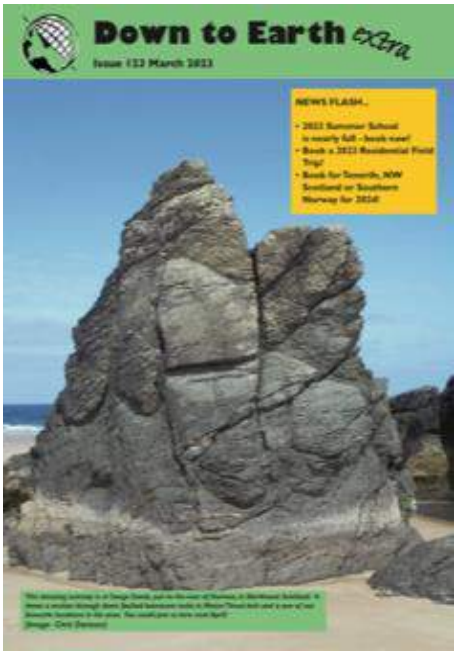
Down to Earth Extra

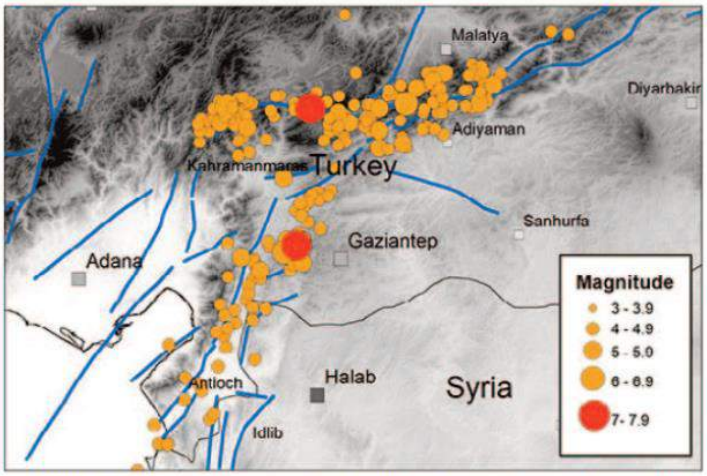
by Chris Darmon and Colin Schofield

Members may be familiar with the ‘Down to Earth Magazine’ if you have ever bought geological map, books or equipment from Geo Supplies Limited based in Sheffield. They often include one of their magazines with your purchase.

The magazine is quarterly by subscription. However, they often send a free shorter version called the ‘Down to Earth Extra’ It is mainly adverts for upcoming residential field trips and newly published books. However, the latest one carries an interesting article on the Turkey/Syria earthquake by Brian Baptie & Margarita Segou, Seismologists at BGS Edinburgh. To view online click on the link below:
Link:

https://mcusercontent.com/5e1ddb80db2745d7dda6fef1b/files/ce2c87ff-6209-3987-bf5f-1a1312e56d8f/DtoE_extra_March_2023.pdf





Evolution of the southern Turkey earthquake sequence along with mapped active faults (blue lines). (Image: BGS © UKRI)

Bath Geological Society Membership - 2023

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As ever, we have a varied and exciting programme of lectures and guided trips to look forward to, including a field trip concerning dinosaur footprints. More details will be available soon!

The membership fees for the full year from January to December 2023 are:

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You can make a bank transfer using the details below.

Account name: Bath Geological Society

Sort code: 40-09-19

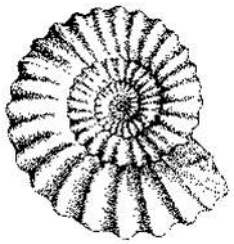
Account number: 71262556

Reference: BGS / [Your name]

Alternatively, you can post your cheque along with your membership form to the membership secretary: Ms Katie Munday, The Membership Secretary, 6 Lymore Terrace, Bath, BA2 2JL, or bring your cheque or cash payment with you to the next meeting at BRLSI.

On behalf of the Committee may I thank you for your support and we look forward to meeting with you again.

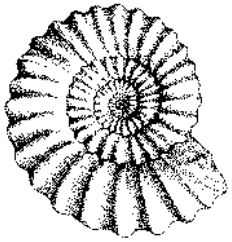
Best wishes,



Katie Munday

membership@bathgeolsoc.org.uk
Bath Geological Society Membership Secretary

Bath Geological Society Newsletter April 2023



In April we returned to face-to-face lecture meetings at BRLSI, Queen Square, Bath. Our speaker, Professor Mike Benton from Bristol University, gave us a very engaging lecture about extinctions and how life survived, adapted, and evolved. Before the lecture we were able to see the Riches of the Earth mineral exhibition and take part in the reception and meet the curator, Matt Williams. The exhibition about minerals and colour will run until October 7th 2023. (See page 4 for further details).

Our next meeting will take place on **Thursday May 4th 2023** at 7:30pm in BRLSI, Queen Square, Bath. This will be a series of short talks given by our members. Members' evenings were a regular feature in the Society's calendar several years ago. From the wide range of topics covered they demonstrate the diversity of our members' geological interests. This will be a hybrid lecture so those who cannot attend in person will be able to watch on zoom. Members will be sent the zoom details and visitors and guess are ask to register via Eventbrite. (See page 2)

On Friday May 5th 2023 **Professor Maurice Tucker** will lead us on a field trip to Penarth and Sully in South Wales. We hope to see some dinosaur footprints, details of the trip are shown on page 3. Please register with Bob Mustow on field@bathgeolsoc.org.uk if you would like to attend.

The 2022 Journal of the Bath Geological Society has received good feedback and we are now looking for items for the 2023 edition. If you see something inspiring to write about, please do so, and send your articles to Mell. journal@bathgeolsoc.org.uk articles have already started to arrive for the next 2023 Journal, but we need more.

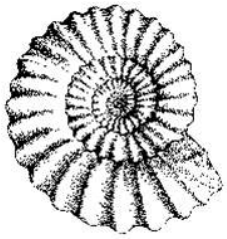
I am pleased to report David Hall has joined the committee and is helping Anne Hunt with the lecture programme. If you are interested in helping to run the Bath Geological Society, we would love to hear from you, we are looking for someone to organise the field meetings for 2024. Finally, if you have not already renewed your membership for 2023, I would encourage you to do so, details are available on page 5. I would like to thank you for your continued support of the Bath Geological Society.

Graham Hickman

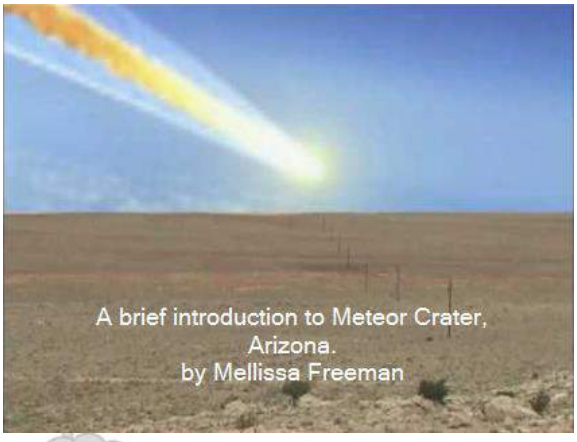
chairman@bathgeolsoc.org.uk

In this issue:

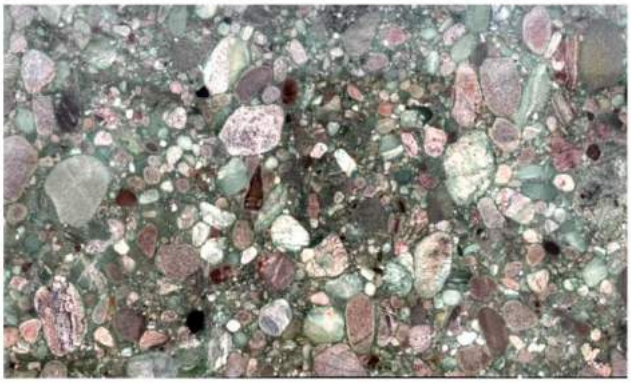
Bath Geological Society lecture
Thursday May 4th @7:30pm

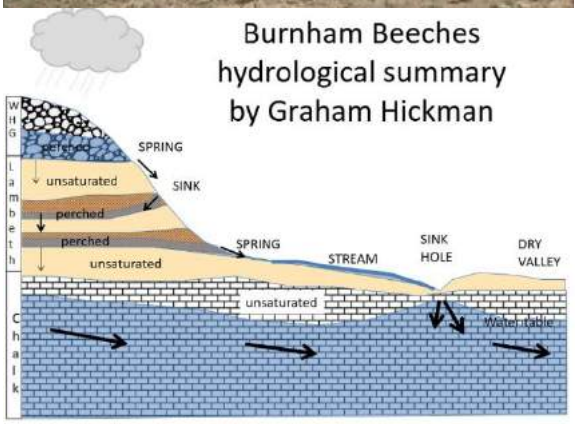


Title: 'Short talks from Members'
Speakers: Freeman, Hall, Hickman and Hunt.
(Sounds like a firm of Solicitors …but we are just four enthusiastic geologists!)

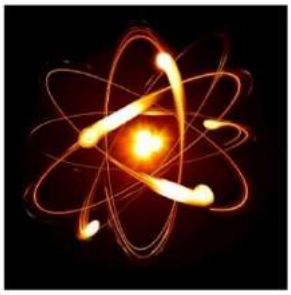


A Bit of Brazil in Bath - The Precambrian Metaconglomerate
By David Hall





A brief look at naturally occurring fission reactors. By Anne Hunt



Abstract: Four short talks on very different topics (1) An introduction to the meteor crater, Arizona. (2) A bit of Brazil in Bath. (3) Hydrology at Burnham Beeches. (4) Naturally occurring fission reactors.

Please note: this will be a hybrid lecture – it will take place in person at BRLSI, Queen Square Bath, BA1 2HN, but will also be broadcast via Zoom for those unable to join us in person. Tea and coffee will be available following the lecture.

Lectures are **free to members**. We will email the joining instructions and the Zoom meeting info to members. Non-members and visitors must register via Eventbrite.

Get Tickets

https://www.eventbrite.co.uk/e/short-geological-talks-from-members-tickets-622935876977

Bath Geological Society Field excursion

PENARTH AND SULLY, SOUTH WALES

Dinosaur footprints and associated Triassic-Jurassic sediments

Friday 5th May 2023

Leader: Maurice Tucker

FIELD EXCURSION SUMMARY

This fieldtrip to South Wales will examine upper Triassic and Lower Jurassic sediments exposed along the coast to the SW of Cardiff. In the morning we will visit the controversial dinosaur footprints reported in the media (see BBC news online August 2020) and featured in the Channel 5 TV programme "Behind the Scenes at The Natural History Museum" broadcast last year. They are exposed in outcrops of Upper Triassic mudrocks on the beach 800 metres south of Penarth Pier. We will also see the red Mercia Mudstone with nodules of alabaster (Penarth 'marble') and Rhaetic and Lower Lias limestones and mudrocks, some with many fossils.

In the afternoon we will drive 6 km to Bendrick Rock, near Sully, to see more dinosaur footprints, which were discovered in 1974 and are frequently in the news (last in January 2021 when a fine specimen was found by a 4-year old girl, also on BBC news online). Also here are many interesting sedimentary structures in the Triassic red beds, deposited by flash floods and streams, near the margin of a desert lake or playa where the Mercia Mudstone was deposited. These sediments lie unconformably on Carboniferous limestone.

Meet at Penarth Pier at 10.30 am. Finish by 4.30 pm.
Bring a packed lunch or there are cafés on the promenade and pier at Penarth.

At Penarth, we will be walking along the beach, which is stony in places. At Bendrick Rock we will be on a cliff path and across the rocks. Low risk and few hazards at both places.

Free car park at Cliff Parade, Penarth, Postcode: CF64 5BP.
For Bendrick Rock use postcode CF63 3RF
(for Barry Recycling Centre).

To Register for the fieldtrip please contact
Bob Mustow on: Field@bathgeolsoc.org.uk
Fieldtrips are free to members but £3 for non-members to cover insurance.

Geo-miscellanea – article by David Hall

The earliest Geological Map?

In the early 1800's, Napoleon's emissaries in Egypt discovered this map from a tomb, in the village of Deir el-Medina, the home of craftsmen who had worked on the temples of the pharaohs in the Valley of the Kings.

The map was drawn around 1150 BC, by Amennakhte, the official "Scribe-of-the-Tomb." It records the geologic features of Wadi Hammamat, the "Valley of Many Baths," apparently for pharaoh Rameses the IV, to help plan mining expeditions to the area.

Amennakhte had invented a graphical language to represent strata layers, rock types, topographic lines, faults and other features, and investigations by James Harrell* have shown that the map is accurate enough to be used today. As the next known geologic maps were drawn some three thousand years later can Amennakhte be considered as the first geologist?

**Emeritus professor of geology at University of Toledo with long-term focus on "Egyptological geology".*

http://www.eeescience.utoledo.edu/Faculty/Harrell/Egypt/Turin%20Papyrus/Harrell_Papyrus_Map_text.htm

Riches of the Earth

Free Exhibit @ BRLSI, Queen Square Bath.

Sat 1 April 10:00 am - Sat 7 October 4:00 pm BST

Free exhibition: Queen Square, Bath

This exhibition runs from **Saturday April 1st until Saturday October 7th 2023, 10am to 4pm every day except Sundays.**

Riches of the Earth reveals the beauty of minerals through the astounding forms and vibrant colours of more than a hundred carefully selected specimens from the Bath Royal Literary and Scientific Institution Collection.

Alongside these, exquisite close-up photographs will allow visitors to appreciate tiny details of crystal form and colour. The marvellous colours and forms of these natural wonders will delight the viewer: glacial blue-green beryl, rainbow-hued opal, fiery red heulandite, lurid yellow sulphur, along with hexagonal prisms of aragonite, eccentrically fused cubes of fluorite, and needle-like crystals of Goethite.

Link:

https://www.brlsi.org/whatson/riches-of-the-earth-the-beauty-of-minerals/?mc_cid=7deb73e2e3&mc_eid=5202693778

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Account number: 71262556

Reference: BGS / [Your name]

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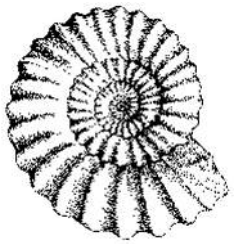
On behalf of the Committee may I thank you for your support and we look forward to meeting with you again.

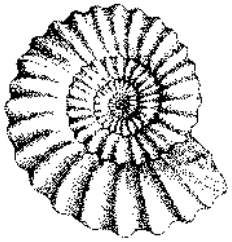
Best wishes,



Katie Munday

membership@bathgeolsoc.org.uk
Bath Geological Society Membership Secretary

Bath Geological Society Newsletter May 2023



In May our lecture meeting took the form of a 'Members Evening' with four short talks from Mellissa Freeman, Anne Hunt, Graham Hickman and David Hall. Members responded positively to the short talks, diversity of topics and the fast pace of delivery. Apparently, in the past, Members evenings were a regular feature at the Bath Geological Society. If you have a talk you would like to share at a future date, please let me know. Also, in May Professor Maurice Tucker led a very well attended field trip to Penarth to see some dinosaur footprints. Despite the soaking we all got in a massive downpour everyone enjoyed themselves and got back safely.

Our next meeting will take place on **Thursday June 1st 2023** at 7:30pm in BRLSI, Queen Square, Bath. The topic will be 'Managing Geological Risks in Mineral Extraction' the speaker is Mark Howson who is a semi-retired geological mining consultant. Mark is also doing a PhD at Bristol and has recently become the Secretary of the Bristol Naturalists Society - Geology Section. It is in this capacity that Mark is also leading a **field trip on Sunday June 4th 2023** to Portishead for BNS. Bath Geological Society Members are invited to attend under our reciprocal arrangement for field trips. To register please details on page 3.

On **Saturday June 10th 2023 Professor Peter Worsley** will lead a trip to examine the sarsens of the Marlborough Downs, details of the trip are shown on page 4. Please register with Bob Mustow on field@bathgeolsoc.org.uk if you would like to attend.

Please consider writing an article for the 2023 Journal of the Bath Geological Society. If you see something inspiring to write about, please do so, and send your articles to Mell. journal@bathgeolsoc.org.uk articles have already started to arrive but we need more!

One extra item that has been brought to our attention is the next talk at the Bath U3A group, although not strictly geological, members may be interested to hear about the history and archaeology of the North Sommerset Coal Fields. Details on page 3.

If you are interested in helping to run the Bath Geological Society, we would love to hear from you, we are still looking for someone to organise the field meetings for 2024. Finally, if you have not already renewed your membership for 2023, I would encourage you to do so, details are available on page 6. I would like to thank you for your continued support of the Bath Geological Society.

Graham Hickman

chairman@bathgeolsoc.org.uk

In this issue:

Bath Geological Society lecture
Thursday June 1st @7:30pm

Title: 'Managing Geological Risks in Mineral Extraction'
Where: BRLSI, Queen Square, Bath & also on Zoom.
Speaker: Mark P. Howson. Geological Mining Consultant.

Abstract: Extracting the metals and minerals that we use in our lives depends on their geology, whose research underpins great mountains of endeavour, which may cost multi-millions or billions of dollars, up to 10 years before even the first product is sold. While success can bring huge profits, the losses can also be huge when things go wrong. So, management of risk, especially the risk of geological misinformation, is vital to assure the confidence of those who invest in the industry. In the second half of the last century a series of mining investment disasters occurred, especially in Australasia, Canada, and the USA. Some were cases of fraud, but others involved subtleties in geology and extractive technology that were too arcane to be understood outside the industry. Mining industry professionals, led by geologists, were prompted to self-regulate by producing and updating a series of national standards or codes for public reporting of Exploration Results, Mineral Resources and Mineral Reserves, collectively termed mineral assets. This talk mainly focusses firstly on some cases where things went wrong, and then considers how to apply good practice. Mark Howson's talk relates several case examples of some of these aspects, especially geological details, drawn from his career.

Please note: this will be a hybrid lecture – it will take place in person at BRLSI, Queen Square Bath, BA1 2HN, but will also be broadcast via Zoom for those unable to join us in person.

Lectures are **free to members**. We will email the joining instructions and the Zoom meeting info to members. £5 donation is requested from non-members and visitors via Eventbrite.

Get Tickets

https://www.eventbrite.co.uk/e/managing-geological-risks-in-mineral-extraction-tickets-633872428497

Bristol Naturalists' Society Field Meeting: Portishead Coast

Sunday June 4th, 10am-1:00pm
Leader: Mark Howson

Field Trip Description: We will visit exposures of Devonian, Carboniferous and Triassic rocks, see trace fossils, palaeosol, marine crinoids and corals, plant fossils, and no less than two unconformities. We will examine folding and faulting structures that exemplify the uplifting processes that build a mountain chain. I will produce a notice with an itinerary, but we are likely to start at the Windmill Inn, at 10:00, when the tide has fallen sufficiently, and end at 16:30-17:00 at the steps from the beach near the Royal Inn and the lifeboat station, when the tide will be rising again. We will take a break from 12:30 to 14:00, which will be a good opportunity for a picnic at Portishead Lake Grounds. Please complete the form below if interested, for me to send the details in due course.

To register complete and submit the online form:

https://bristolnats.org.uk/events/portishead-coast/

Please Note: Members of the Bath Geological Society are invited to attend this field trip under our reciprocal arrangement for field trips.

Bath U3A Lecture

June 1st at 10:30am
Title: "The North Somerset Coal Field"

Speaker: Shane Gould, Head of Industrial Heritage Strategy at Historic England

Description: English Heritage - The History and Archaeology of the North Somerset Coal Fields

Location: Bath Pavilion https://u3ainbath.uk/

The sarsens of the Marlborough Downs

Saturday 10th June 2023

Leader: Peter Worsley

FIELD EXCURSION SUMMARY

The field excursion will be entirely on foot and will consist of two circuits. The first will be of 6 miles over Fyfield Down/Clatford Bottom north (a rare geomorphological SSSI) in the morning. The lunch break will be taken at 'The Who'd A Thought It' pub (Wadsworth ales) in Lockeridge. The second circuit will be around Lockeridge Dene (National Trust) of 2 miles. If there is interest and energy, an additional walk could be added to the adjacent West Woods, the recently claimed source of the Stonehenge sarsens.

Meet at …

To Register for the fieldtrip please contact
Bob Mustow on: Field@bathgeolsoc.org.uk
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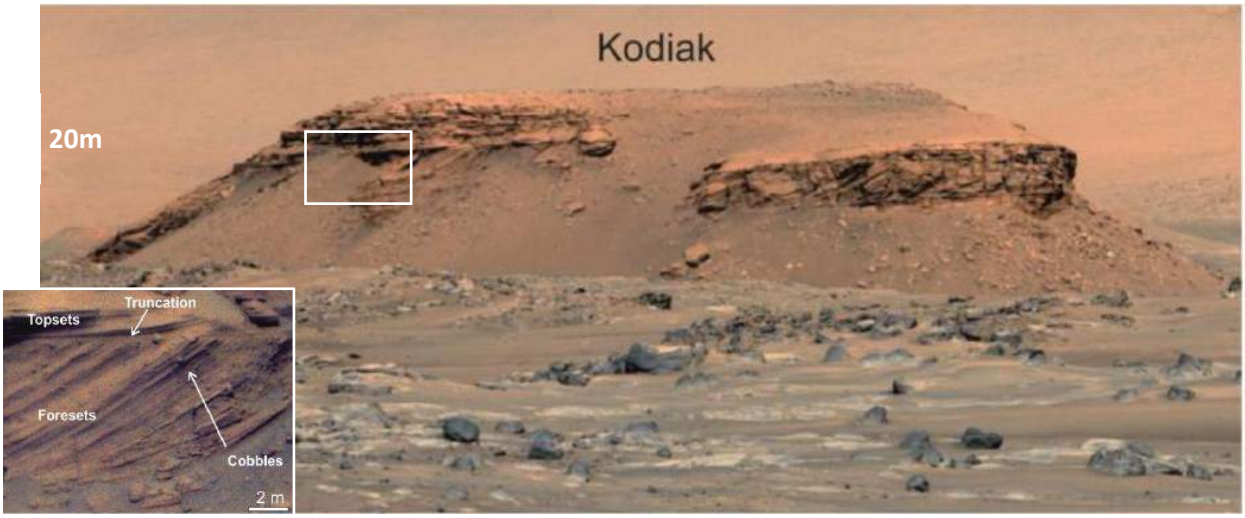
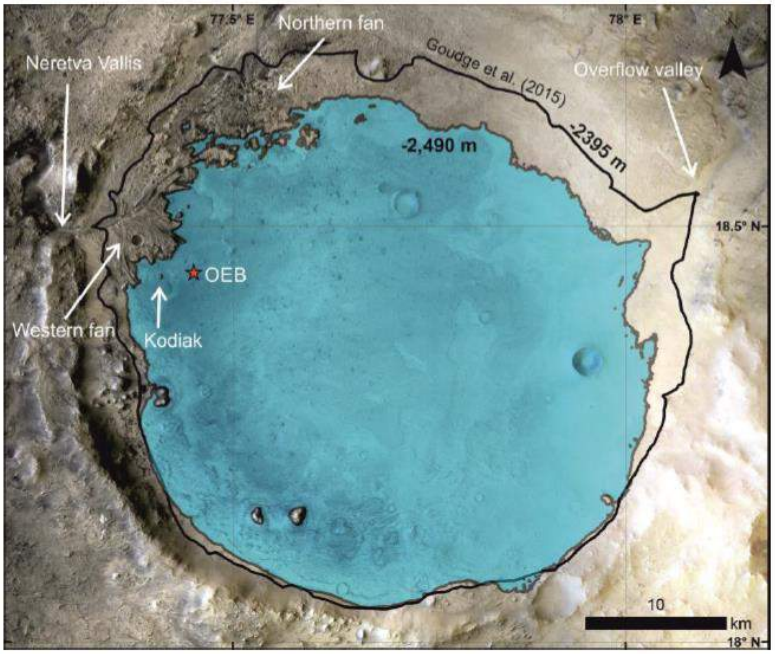
Geo-miscellanea: A Lake Delta on Mars by David Hall

(Images from The Perseverance Rover)



The image above, first published in 2021, shows the Kodiak butte in the Jezero Crater on Mars and is taken as clear evidence that fluvial processes existed on the planet some 3.7 – 3.5 billion years ago.

The well-defined sequence of bottom sets, foresets and topsets are interpreted as fan-delta that prograded into a ponded lake. The uppermost fan strata are composed of boulder conglomerates, which imply deposition by episodic high-energy floodsand the overall sedimentary succession indicates a transition from a sustained hydrologic activity in a persistent lake environment to highly energetic, short-duration fluvial flows.



The image to the left is of Jezero Crater. The blue shading indicates the maximum lake level. The red star is the Perseverance Rover landing site (close to the Kodiak butte).

The origin of the water and the reasons for its disappearance are subjects of on-going discussion. Any ideas?

See also: https://hal.science/hal-03375854/document
https://www.science.org/doi/10.1126/sciadv.abo4856

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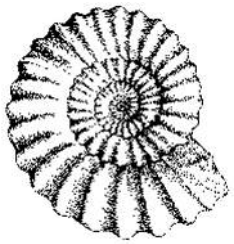
On behalf of the Committee may I thank you for your support and we look forward to meeting with you again.

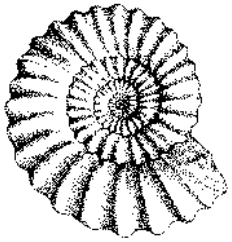
Best wishes,



Katie Munday

membership@bathgeolsoc.org.uk
Bath Geological Society Membership Secretary

Bath Geological Society Newsletter June 2023



Our June lecture meeting was given by Mark Howson, Mark spoke about managing the geological risks in mineral exploration. He explained how the various technical requirements for defining the quality and quantity of a mineral deposit are evaluated and the requirements for competent people to undertake those tasks. The lecture was given in person at BRLSI but also over zoom.

Our next meeting will take place on **Thursday July 6th 2023** at 7:30pm in BRLSI, Queen Square, Bath. The topic will be 'Devonian Forests' the speaker is Dr Chris Berry from Cardiff University. Chris has been studying these earliest known forests when plants evolved rapidly across dry land.

On **Saturday June 10th 2023 Professor Peter Worsley** will lead a trip to examine the sarsens of the Marlborough Downs, details of the trip are shown on page 3. Please register with Bob Mustow on field@bathgeolsoc.org.uk if you would like to attend.

Consider writing an article for the 2023 Journal of the Bath Geological Society. If you see something inspiring to write about, please do so, articles have already started to arrive but we need more! This year we are also holding a **photographic competition**, members are invited to send in geological themed photographs, the deadline for entries will be 30th September 2023. The best photo will be used for the front cover of the journal. Please send your articles and photos to Mell. journal@bathgeolsoc.org.uk

If you are interested in helping to run the Bath Geological Society, we would love to hear from you, we are still looking for someone to organise the field meetings for 2024.

The committee met this week and has started to put together the 2025 programme, following encouraging feedback from the recent members evening, we would like to hear from anyone wishing to present a short talk (10-15 minute) at our next members evening.

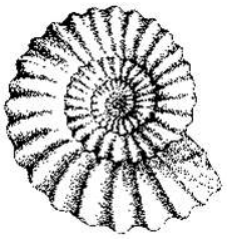
Finally, if you have not already renewed your membership for 2023, I would encourage you to do so, details are available on page 6. I would like to thank you for your continued support of the Bath Geological Society.

Graham Hickman

chairman@bathgeolsoc.org.uk

In this issue:

Bath Geological Society lecture
Thursday July 6th @7:30pm



Title: 'Devonian Forests'
Where: BRLSI, Queen Square, Bath & also on Zoom.
Speaker: Dr Chris Berry, Cardiff University

Abstract: Over the past 30 years much information has come to light about the nature of the Earth's first forest ecosystems. The new evidence has come from both exceptionally preserved fossils, allowing the first accurate reconstructions of early forest trees, and from 'fossil forests', which allow entire ecosystems to be visualised. Examples will be developed from Germany, New York and Svalbard to reveal a completely new understanding of the transition to a forested planet.

Please note: this will be a hybrid lecture – it will take place in person at BRLSI, Queen Square Bath, BA1 2HN, but will also be broadcast via Zoom for those unable to join us in person.

Lectures are **free to members**. We will email the joining instructions and the Zoom meeting info to members. £5 donation is requested from non-members and visitors via Eventbrite.

Get Tickets

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Saturday 10th June 2023

Leader: Peter Worsley

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The field excursion will be entirely on foot and will consist of two circuits. The first will be of 6 miles over Fyfield Down/Clatford Bottom north (a rare geomorphological SSSI) in the morning. The lunch break will be taken at 'The Who'd A Thought It' pub (Wadsworth ales) in Lockeridge. The second circuit will be around Lockeridge Dene (National Trust) of 2 miles. If there is interest and energy, an additional walk could be added to the adjacent West Woods, the recently claimed source of the Stonehenge sarsens.

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Request for Specimens

The Museum of Bath Stone in Combe Down is hoping to open shortly for visitors 2 days a week and we are in the process of redoing our display cabinets. If any members have any fossil specimens from the Bath area of museum quality that they would be willing to either donate or lend to the museum it would be greatly appreciated. We do not have a large amount of space so the specimens would need to be able to fit into a drawer. These draws have Perspex tops so will be safe from visitors' hands.

Regards,
Gavin Gillmore,
gavin.gillmore@btinternet.com
Trustee, Museum of Bath Stone

Geo-miscellanea – Geology in the News

By Maurice Tucker

I am sure many members will have seen this article on **BBC ONLINE NEWS on 30th March, 2023**:

Nine-year-old Eli spotted a 200-million-year-old fossil in a rocky cliff face

Llantwit Major: Boy finds 200-million-year-old fossil on beach

This large ammonite occurs in the Blue Lias, Lower Jurassic, at Llantwit Major on the coast of Glamorgan, South Wales. You can see in the picture below the typical occurrence of the Blue Lias: limestone beds alternating with mudstone layers. There has been much discussion in the literature over the last 50 years over the cause of the interbedding. Some people have suggested it is the result of near-regular, even cyclic, changes in deposition, from a fine carbonate-rich sediment to a clay-rich sediment, perhaps induced by changes in climate, from an arid period when carbonate was precipitated to a more humid time when clay was carried into the moderate depth marine environment by rivers. There may even have been an orbital forcing control on deposition through Milankovitch rhythms. Others have suggested that the sediment was deposited as a completely mixed clay-carbonate and that there was an early diagenetic dissolution-reprecipitation of the carbonate to give the limestone bands. In some cases, the limestones are quite nodular, suggesting at least some diagenetic modification of an original layering.

Blue Lias cliffs - Llantwit Major

Close to Bath, the Blue Lias is well seen along the Bath to Bristol cycle track near Saltford, 200 metres west of the bridge over the river Avon, on the right-hand side. And large ammonites occur here at Saltford too, Image below.

BUT – have you noticed something odd about this ammonite in the cliff at Llantwit Major? That the ammonite shell is vertical! Now that is very strange when you think about it. You would expect the shell to be lying horizontal, parallel with the seafloor / bedding (as the ones at Saltford). So how did the shell end up on the seafloor, standing up vertically? Afterall, it must have stayed vertical for quite a long time until it was eventually buried. The sedimentation rate of clay-fine limestone in the likely moderate depth environment of the Blue Lias (perhaps 20-50 metres) would be measured in the 1000s of years. So how come this ammonite is vertical in the limestone bed?

Answers please on a digital postcard to maurice.tucker@bristol.ac.uk

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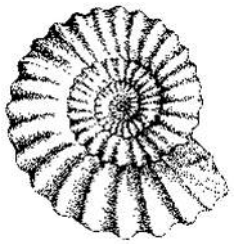
Alternatively, you can post your cheque along with your membership form to the membership secretary: Ms Katie Munday, The Membership Secretary, 6 Lymore Terrace, Bath, BA2 2JL, or bring your cheque or cash payment with you to the next meeting at BRLSI.

On behalf of the Committee may I thank you for your support and we look forward to meeting with you again.

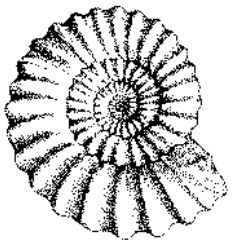
Best wishes,



Katie Munday

membership@bathgeolsoc.org.uk
Bath Geological Society Membership Secretary

Bath Geological Society Newsletter July 2023



This newsletter follows up on **the case of the 'vertical ammonite'** brought to us from a BBC news article spotted by Maurice Tucker. Several members responded to his article and he summarised his findings in this edition. In addition, Charles Hiscock has set us a challenge with a geological riddle. 'A mile south of here, The Maidens of Ayrshire met Robert the Bruce in 1307. Could it be in Devon?' answers on an e-postcard to Charles.

Our July lecture meeting was given by Dr Chris Berry from Cardiff University, Chris spoke about his research into the first forests. The new evidence and how they evolved. It was interesting to see how the fossil tree trunks have been mapped to understand the spacing of trees within these forests. New finds of complete specimens with roots, branches and leaves have been used to reconstruct what these trees might have looked like. The lecture was given in person at BRLSI but also over zoom.

Our next meeting will take place on **Thursday September 7th 2023** at 7:30pm in BRLSI, Queen Square, Bath. The topic will be 'The use of geophysics in archaeology' the speaker is Tony Roberts. Tony is an Associate of the Chartered Institute for Archaeologists and the Director of Archeoscan, a company providing opportunities for community involvement in archaeology. Tony has worked on a wide range of archaeological excavations and used geophysical surveys to discover their secrets.

On **Sunday September 17th 2023 Dr Nick Chidlaw** will lead a trip to Cleeve Hill, near Cheltenham, details of the trip are shown on page 3. Please register with Bob Mustow on field@bathgeolsoc.org.uk if you would like to attend.

Please consider writing an article for the 2023 Journal of the Bath Geological Society. Please send your articles and photos to Mell. journal@bathgeolsoc.org.uk

If you are interested in helping to run the Bath Geological Society, we would love to hear from you, we are still looking for someone to organise the field meetings for 2024.

Finally, if you have not already renewed your membership for 2023, I would encourage you to do so. I would like to thank you for your continued support of the Bath Geological Society.

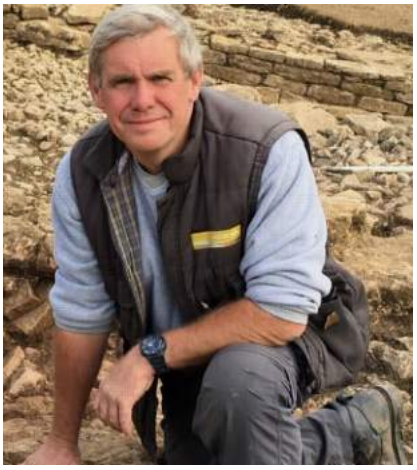
Graham Hickman

chairman@bathgeolsoc.org.uk

In this issue:

Bath Geological Society lecture
Thursday September 7th @7:30pm

Title: 'The use of Geophysics in Archaeology'
Where: BRLSI, Queen Square, Bath & also on Zoom.
Speaker: Tony Roberts (ARCHEOSCAN)



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The Geology of Cleeve Hill, Gloucestershire

Sunday 17th September 2023

Leader: Dr Nick Childlaw

FIELD EXCURSION SUMMARY

Summary: This circular walk (c. 4 miles) aims to inform attendees of the Middle Jurassic sedimentary rocks on the Cleeve Common plateau, using numerous old quarry workings: their stratigraphy and environment of deposition. Located just east of Cheltenham, the highest point of the Cotswolds occurs on the Common (330m OD). On Cleeve Common is found the most complete succession of the Inferior Oolite Group in the Cotswolds. Post-glacial landforms will also be described. The views in clear weather across the Severn Vale to the Malvern Hills and Forest of Dean are impressive

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What has happened here? A geological riddle from Charles Hiscock

The Clue: ‘A mile south of here, The Maidens of Ayrshire met Robert the Bruce in 1307. Could it be in Devon?’

A bit of googling should be helpful! Then a bit of GeoIndex, maybe?

Answers in an e-postcard to Charles carlo.73.hisco62@gmail.com

The answer will be in the next newsletter.

Best wishes, Charles Hiscock

(P.S. the answer is NOT where Charles left his walking pole)

Please Consider writing an article for the 2023 Journal of the Bath Geological Society. If you see something inspiring to write about, please do so, articles have already started to arrive but we need more! This year we are also holding a photographic competition, members are invited to send in geological themed photographs, the deadline for entries will be 30th September 2023. The best photo will be used for the front cover of the journal. Please send your articles and photos to Mell. journal@bathgeolsoc.org.uk

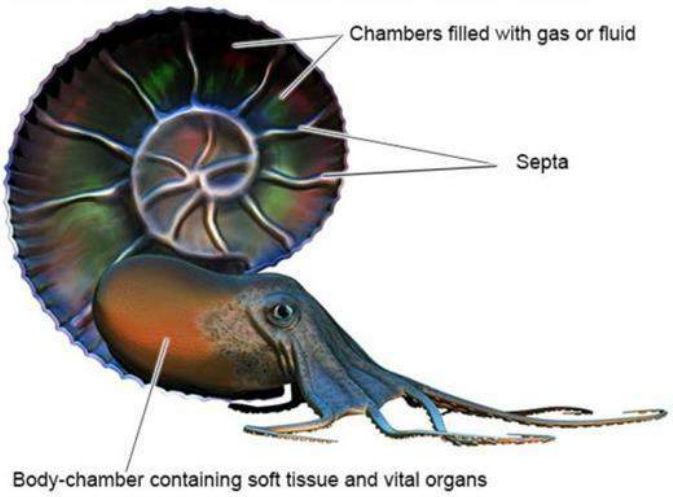
Geo-miscellanea – The case of the vertical ammonite!

By Maurice Tucker maurice.tucker@bristol.ac.uk

Follow-on discussion from this article on **BBC ONLINE NEWS on 30th March, 2023**:

The BBC online news article reporting the discovery of an ammonite by a 12-year-old boy on the coast of Glamorgan South Wales, has prompted much discussion around the dinner table, in coffee rooms and farther afield about the unusual vertical arrangement of that large ammonite shell in a bed of lime mudstone in the Blue Lias Formation.

Following my article about this in the last Bath Geological Society newsletter (June 2023), I have had four useful emails from members with comments and interpretations, from Mick Oates, Charles Hiscock, David Hall and Eric Squires. It has been noted in the scientific literature that the vertical arrangement of ammonite fossils is rare, and Mick Oates, who studied Jurassic ammonites during his PhD, wrote that he had seen small ones (a few cm across) in a vertical position but not larger ones.



https://www.bgs.ac.uk/discovering-geology/fossils-and-geological-time/ammonites

The ammonite, like its modern representative the nautilus, lived within the last open chamber of its shell, called the body chamber. The rest of the shell coiling above the anima (see right

hand image above, curtesy of the BGS website). The chambers behind the living one were separated by septa, and were filled with gas/water as part of the animal's buoyancy system. This enabled the ammonite to ascend and descend within the water column.

In many cases with fossil ammonite shells, the first chamber is filled with mud, since it is open to sediment being washed in once the animal had decayed, but earlier chambers are commonly partly filled with calcite crystals, growing from the chamber walls. The ammonite shell in the cliff (left hand image above) is preserved in the animal's living position as it would have been in the water, i.e., the animal itself in the lower part, that last chamber now filled with sediment. The shell then landed the right-way up, suggesting that the buoyancy was such that the shell could descend directly and lodge vertically in the mud. Everyone agrees that the consistency of the seafloor mud would have been a crucial factor, in that once the ammonite shell had landed on the seafloor, it did not topple over. Mud on the seafloor generally has a thin soft soupy layer before the sediment becomes stiff, 5-20 cm below the sediment-water interface. The ammonite must have sunk deep enough into the mud so it could be held there and so preserved in the vertical position; sedimentation rates in water depths of around 100 metres are generally quite low, so the time to bury the shell may have been 100s of years, even 1000s. But then on the other hand, as Charles pointed out, the ammonite might have been buried quite quickly since otherwise one might expect scavenging animals to have poked around and caused it to topple over.

Although there is no apparent evidence of syn-sedimentary deformation, slumping or folding at the site in Glamorgan and in the bed with the ammonite, there is still the possibility that the shell was transported from elsewhere. David and Eric suggested that the shell could have been carried to the seafloor in a slump or by a density current: a mixture of mud and water, as may have been generated by a storm. One could imagine the shell being weighed down by the mass of the animal itself in the last chamber (or sediment already deposited there) so that it ended up in the correct orientation and vertically in the sediment when deposited from the density current. But on the other hand, if transport by a density current was involved one might expect a more random orientation of the shell, even in a horizontal position if the shell was sliding across the seafloor as the current slowed down. It might seem remarkable, but impact marks have been described on bedding planes from where fossils have been bouncing along on the seafloor.

The shell of this ammonite does not appear to have suffered any compaction or breakage, although one is just looking at an image taken from about 10 metres away; this is probably the result of the lime mud sediment being lithified relatively early during burial, contrasting with clayey mud which does not normally lithify near surface but suffers significant compaction as a result of water loss in the upper few metres during burial. Hence fossils in mudrocks are commonly crushed and flattened.

So, all in all, the vertical ammonite at Llantwit Major is a bit of conundrum and next time we are looking at the Blue Lias at Charmouth or Lyme Regis, we should keep our eyes open for more vertical ammonites.

References:

For those interested in this topic, Eric discovered a couple of papers on the internet:

Olivero, E.B. (2007) Taphonomy of ammonites from the Cretaceous of Antarctica. Palaios 22, 586-597.

Raup, D. M. (1973) Depth inferences from vertically imbedded cephalopods. Lethaia 6, 217-226.

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If you prefer, you can complete the standing order form from the download button at the bottom of the webpage and hand it to one of the Committee at one of our meetings, or post to the below address.

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Sort code: 40-09-19

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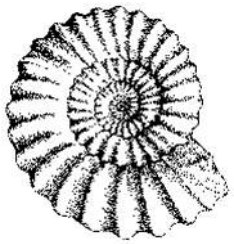

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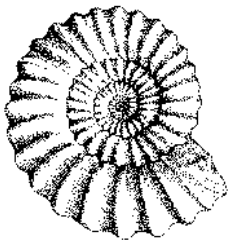

I hope you have all had an enjoyable summer, as you know the Bath Geological Society does not meet in August, now its September we are catching up! September brings lots of opportunities to meet. We have two field trips and an indoor meeting planned.

The first September field meeting is organised by the Bristol Naturalists Society (BNS-Geology Section) and led by Simon Carpenter. It will be held on the afternoon of **Sunday September 3rd 2023** to a middle Jurassic site near Woolverton. As many of you know we have a reciprocal arrangement with BNS and West of England Geologists' Association (WEGA) to attend their field meetings and for their members to attend Bath Geological Society field meetings, as such we have been invited to attend this BNS field meeting. If you are interested in attending, please contact Simon Carpenter.

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This newsletter also follows up on the geological riddle and photographs Charles Hiscock sent us entitled **'What happened here?'** Charles explains his interpretation and the riddle is solved! As we approach the end of the year, please consider writing an article for the 2023 Journal of the Bath Geological Society. Please send your articles and photos to Mell. journal@bathgeolsoc.org.uk . The Bath Geological Society have also been invited, as an Affiliate member, to attend the Festival of Geology on November 4th in UCL which is organised by the Geologists' Association. Prior to the pandemic a small group of our members travelled up to the festival annually. If you are interested in helping to uphold this tradition, please let me know.

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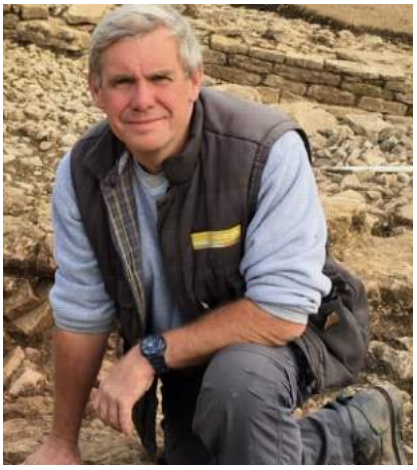

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Bristol Naturalists' Society Field Meeting: THE LOWER CORNBRASH (MIDDLE JURASSIC) NEAR WOOLVERTON, SOMERSET

Sunday September 3rd 2023, 2pm-5pm
Leader: **Simon Carpenter**

To register please email Simon Carpenter at simonccarpenter@gmail.com

Joining instructions and meet up location will be given on Registration

Field Trip Description: The meeting visits a Middle Jurassic (Lower Cornbrash) site rich in fossils currently being studied by Simon Carpenter. The fossils, all ex-situ, have been found from an extensive series of spoil heaps. Simon will discuss the biostratigraphy and paleoecology of the Lower Cornbrash and will bring a selection of the fossils he has collected for attendees to see. Collecting is permitted. There will be a limit in numbers, so advance bookings are essential.

https://bristolnats.org.uk/events/the-lower-cornbrash-middle-jurassic-near-woolverton-somerset/

The Bath Geological Society Journal

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A geological riddle – Solved!

But first some background. During a holiday to Dumfries and Ayrshire in June 2023, on a grey damp day, Gill and I went to Maidens, a small coastal village about 15 km south-west of Ayr, as it seemed to provide suitable walking ground for the 'not so young'. We walked from the harbour north along the saltmarsh and low sand dunes towards the woods and high ground at the north end of the beach. After a mile or so along the beach our walk was brought to an abrupt end by a cliff, 6 metres at the highest point, that jutted about 80 metres out to sea. It was the structure of the cliff that sparked my interest – it seemed to be in 3 distinct beds (photo 1 below).

Photo 1

Photo 2

Closer examination showed the bottom bed to be a flat and thinly bedded conglomerate in a coarse sandy matrix. The middle bed was a similar conglomerate only a few centimetres thick, in a softish friable sandy matrix which was well weathered back so that the cliff was deeply undercut along most of the visible length. The top bed was massive with a random mix of pebbles and angular clasts in the lowest layer. Above this brecciated layer the rock showed some flow lines characteristic of lava flows but is generally devoid of structures. (Photo 2). So, I said (probably out loud) **'What's happening here?'**

Now for the riddle: The main clue was 'A mile south of here, The Maidens of Ayrshire met Robert the Bruce in 1307. Could it be in Devon?' The second clue: 'A bit of googling should be helpful! Then a bit of GeoIndex, maybe?'

The googling bit should have provided you the location. 'Maidens' is a seaside village on the coast of Ayrshire, having got its name from the volcanic dykes, the 'Maidens' that project NE from the headland on the south side of the harbour. The main dyke was raised and widened with concrete to increase the protection from storms to the fishing fleet. It was on this headland that Robert the Bruce landed in 1307, having crossed from Arran, and where he rallied the local people to attack and defeat the English forces at the Battle of Loudoun Hill. The locality of the photos is a mile north of Maidens.

Now the GeoIndex bit. Using the British Geological Survey websites GeoIndex or Geology Viewer App, the following story unfolds.

'Could it be in Devon?' (Sorry, a bit cryptic maybe?) The BGS websites states that the bottom bed is Silurian, late Ludlow, to early Devonian red-brown, grey-green medium to coarse grained terrestrial sandstones with subordinate pebble beds and conglomerates of the Swanshaw Sandstone Formation (427.4-393.3 Mya).

The massive top 'bed' is a dyke of the North Britain Palaeogene Dyke Suite – microgabbro, tholeiitic, igneous rock formed between 66 and 23.03 Mya (or 66 -55 Mya- Source - Geology North). The lowest layer is volcaniclastic containing rip-up angular clasts and pebbles from the underlying Devonian sandstone. The central area is mainly structureless basalt but overlying it there is evidence of vertical fractures. Is it showing signs of columnar jointing, suggesting rapid cooling (e.g., Island of Staffa)? At the right-hand end there is a column with flow lines.

The middle 'bed' is the unconformity between the Devonian and the Palaeogene. It is the contact zone between the Devonian conglomerate and the Palaeogene microgabbro which has been baked, causing it to be less competent due to heating by the lava flow and thus making it much more prone to sea erosion.

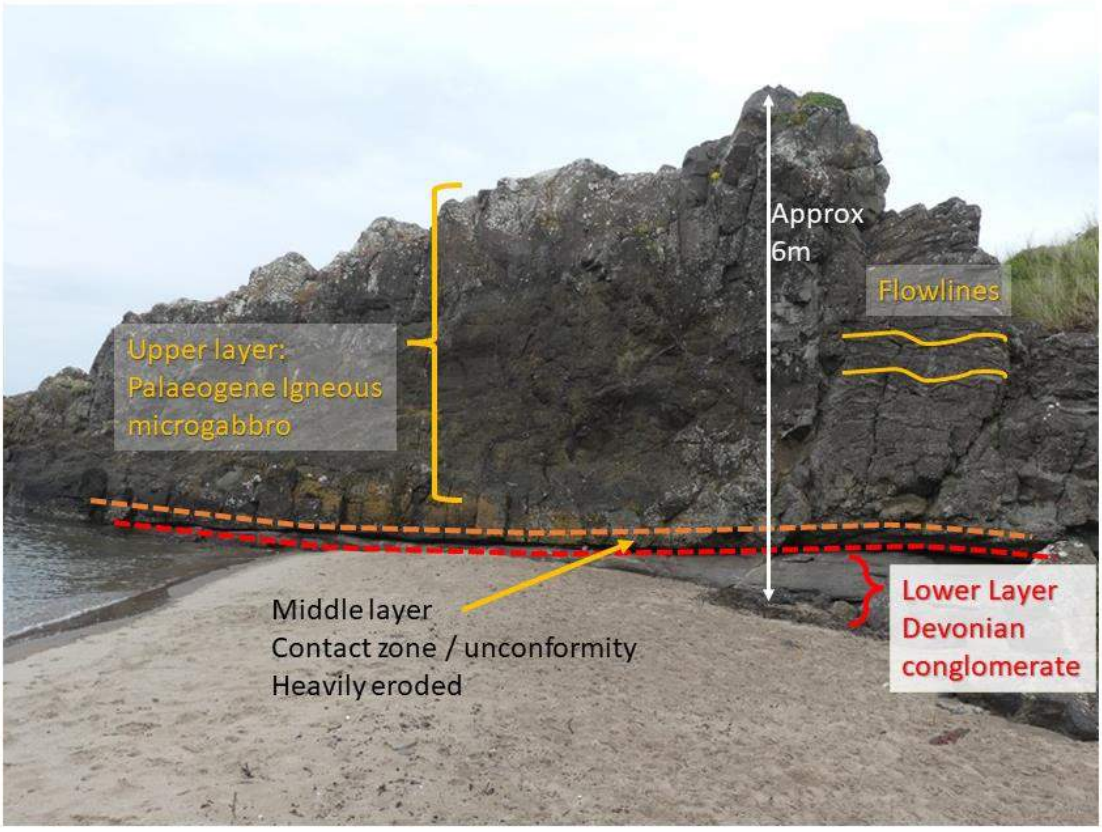


Photo 1 – with the interpretation illustrated.

There are a great many of these dykes along the west coast of Scotland, a high proportion being oriented NW/SE, the products of the volcanic outbursts centred on the island of Mull associated with uplift caused by a proto-Icelandic mantle plume and consequent opening of the Atlantic Ocean.

I had two replies, from Maurice Tucker and David Hall, both very close to my own ideas. David suggested that the bottom volcaniclastic layer was a 'peperite' where molten lava had flowed over wet sediment. The effect of the cold wet sediment on hot molten lava produces large numbers of very small globules of molten lava which, cooling very rapidly in the sediment, produce the visual effect of black peppers, hence the name 'peperite'. However, the time gap between the Devonian conglomerate and the Palaeogene basalt rules out a peperite but the molten lava could have flowed over an erosion surface covered in wet scree and causing the volcaniclastic appearance. There is no information on the BGS websites to substantiate this.

I leave it to the experts to see if they agree with my interpretation and thank Maurice and David for having a go. It certainly put my limited geological knowledge to the test.

Charles Hiscock carlo.73.hisco62@gmail.com

Are you Interested in helping organize events for the Bath Geological Society?

We are currently looking for a Field Meeting Secretary to help arrange our field program for 2024.

Please email the chairman to find out more.
chairman@bathgeolsoc.org.uk

The Geologists' Association

Festival of Geology 2023

University College London
Gower Street
London WC1E 6BT
10:30am to 4.30pm

Free admission

No pre-registration necessary, just turn up on the day

Programme

Saturday, 4 November 2023

Exhibitors from around the world - including fossil & mineral displays from local groups and affiliated societies, books, maps, photo-competition, Mary Anning maquette and much more!

Special Exhibit: *"The Maps: Smith & Greenough - in the same room once again!"*

Special Lecture: *"Geology of Hogwarts"* - Dr Leanne Hughes [BGS]

Sunday, 5 November 2023

A range of local and accessible field trips including The Albert memorial, Crystal Palace dinosaurs and The Westbourne

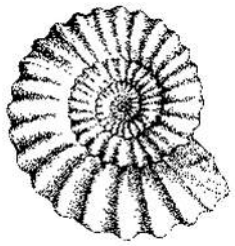
For Further information:

Contact Details:
Tel: 020 7434 9298
https://geologistsassociation.org.uk
&
www.rockwatch.org.uk

ROCKWATCH

UCL

Registered Charity no. 233199



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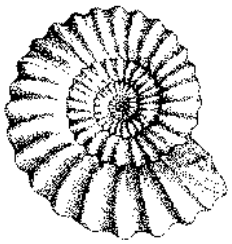

It is certainly starting to feels like the autumn as the trees start to turn colour. During September we had an interesting lecture from Tony Roberts on the use of Geophysics in Archaeology and the opportunity to attend a field meeting led by Simon Carpenter. Unfortunately, we had to reschedule the trip led by Dr Nick Chidlaw, this will now take place on Saturday 28th October.

Our next indoor meeting will take place on **Thursday October 5th 2023** at 7:30pm in BRLSI, Queen Square, Bath. The topic will be 'The Geology of The Himalaya Made Simple' the speaker is Dr Danny Clark-Lowes. The talk will follow the route of a 'mega-transect' from the Indian Plate across the Himalayan Mountain Range to the Tibetan Plateau on the Eurasian Plate. Danny's geology guide to the Himalaya was published in November 2022 by the Geologist's Association (Guide No 76).

Rescheduled to **Saturday October 28th 2023 Dr Nick Chidlaw** will lead a trip to Cleeve Hill, near Cheltenham, details of the trip are shown on the advert. Please register with Bob Mustow on field@bathgeolsoc.org.uk if you would like to attend.

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Members may also like to attend events organised as part of **Mendip Rocks! 2023**. This runs from October 1st through to October 22nd. There are numerous walks and events including a Geo-Lecture Day at the Somerset Earth Science Centre, Moons Hill Quarry on Saturday 14th October. The talks will be by Prof. Mike Benton, Dr Peter Hardy and Dr Duncan Price.

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Where: BRLSI, Queen Square, Bath & also on Zoom.
Speaker: Dr. Danny Clark-Lowes

Abstract: This talk will follow the route of a 'mega transect' from the Indian Plate across the Himalayan Mountain Range to the Tibetan Plateau on the Eurasian Plate. Dr Danny Clark-Lowes (Cambridge and London Universities) is a geologist with over 40 years of experience. He worked for Shell and other companies before founding Nubian Consulting with a focus on North Africa. He is the author of numerous publications on the geology of Libya and edited the Geol Soc Special Publication 'Petroleum Geology of North Africa (1998). He is also a keen mountaineer who has climbed in the Swiss Alps and in the Himalaya where he has been leading trips for over seven years. His guide to the Himalaya was published in November 2022 by the Geologist's Association (Guide No 76).

Please note: this will be a hybrid lecture – it will take place in person at BRLSI, Queen Square Bath, BA1 2HN, but will also be broadcast via Zoom for those unable to join us in person.

Lectures are **free to members**. We will email the joining instructions and the Zoom meeting info to members. £5 donation is requested from non-members and visitors via Eventbrite.

Get Tickets

https://www.eventbrite.co.uk/e/geology-of-the-himalaya-made-simple-tickets-716533700587

The Geology of Cleeve Hill, Gloucestershire

Saturday 28th October 2023

Leader: Dr Nick Childlaw

FIELD EXCURSION SUMMARY

Summary: This circular walk (c. 4 miles) aims to inform attendees of the Middle Jurassic sedimentary rocks on the Cleeve Common plateau, using numerous old quarry workings: their stratigraphy and environment of deposition. Located just east of Cheltenham, the highest point of the Cotswolds occurs on the Common (330m OD). On Cleeve Common is found the most complete succession of the Inferior Oolite Group in the Cotswolds. Post-glacial landforms will also be described. The views in clear weather across the Severn Vale to the Malvern Hills and Forest of Dean are impressive

To Register for the fieldtrip please contact
Bob Mustow on: Field@bathgeolsoc.org.uk
Risk assessment and meeting location will be provided on registration.
Fieldtrips are free to members but £3 for non-members to cover insurance.

Bath Geological Society - 2024 Members Evening.

Anyone wishing to present a short talk (10-15 minute) at our next members evening please email the chairman. chairman@bathgeolsoc.org.uk

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FESTIVAL OF GEOLOGY

GEOLOGISTS' ASSOCIATION 1858

Saturday 4 November 2023

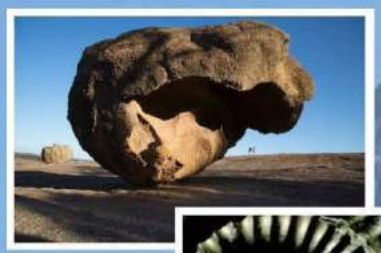
10:30am to 4:30pm *Free admission*

University College London
Gower Street WC1E 6BT

UCL

For everyone interested in the story of the Earth

Children and families welcome!



- Exhibits by societies, universities and museums with minerals and fossils for sale
- Lecture: 'The Geology of Hogwarts'
- Books, meteorites, Mary Anning maquette and photo-competition
- Activities for children

ROCKWATCH
The UK's Nationwide Geology Club for Children

- Special map exhibit and much more!

Also: Field trips on Sunday 5 November to the Crystal Palace dinosaurs, Albert Memorial etc.

See website for full schedule

www.geologistsassociation.org.uk

MENDIP ROCKS! 2023

A festival of events running 1st - 22nd October 2023 to celebrate the awe-inspiring 450-million-year geology of the Mendip Hills!

PEN HILL GEO WALK
Sunday 1st October. 10.30am – 1pm. Meet at junction between Little Entry and North Road, Wells, BA5 2TJ.
what3words///represent.surveyors.skunks.

BUILDING STONES OF WELLS GEO WALK
Tuesday 3rd October at 10am to 12.30pm. Meet in front of Wells and Mendip Museum, 8 Cathedral Green, BA5 2UE. ST 5509 4593.
what3words ///crunched.funky.scored.

BUILDING STONES OF FROME GEO WALK
Thursday 5th October. 2pm-4pm. Meet at the front of the Cheese & Grain, Market Yard, Justice Lane, Frome, BA11 1BE.
what3words ///doctor.petal.forum.

BATTS COMBE QUARRY MINIBUS TOURS
Wednesday 11th October – Tours at 10am & 2pm.
Meet at the Somerset Earth Science Centre, BA3 5JU.
what3words ///thumb.diverged.alcove.

UNTANGLING GEOLOGICAL TIME AT TEDBURY CAMP GEO WALK
Thursday 12th October. 10.30am-12.30pm.
Meet in the layby at Fordbury Bottom near Great Elm, Mells. Grid Ref: ST 749 492.
what3words ///merge.saloons.science.

GEO LECTURE DAY
Saturday 14th October. 12.30am-4.30pm. Somerset Earth Science Centre, Moons Hill Quarry, BA3 5JU.
what3words ///thumb.diverged.alcove.

COALFIELDS, CANALS AND RAILWAYS OF CAMERTON WALK
Sunday 15th October. 10.30am-2.30pm. Meet at junction between Camerton Hill and Durcott Lane, BA2 0PS.
what3words///dolls.ladders.mashing.

WHATLEY QUARRY MINIBUS TOURS
Wednesday the 18th October - Tours at 10am & 2pm.
Meet at the Somerset Earth Science Centre, BA3 5JU
what3words ///thumb.diverged.alcove.

CORAL SEAS & MOUNTAIN BUILDING GEO WALK
Thursday the 19th October. 10am-3pm.
Meet at the car parking at Blackmoor Reserve car park, Charterhouse, BS40 7XR.
what3words///takes.grumble.broadens.

SOMERSET EARTH SCIENCE CENTRE MUSEUM AND OPEN DAY
Saturday 21st October. 11am - 3pm.
Somerset Earth Science Centre, BA3 5JU.
what3words ///thumb.diverged.alcove.

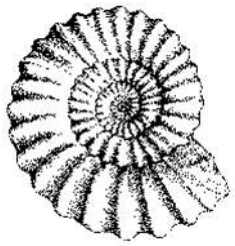
MOMENTS ON MENDIP OUTDOOR PROJECTIONS EXHIBITION
Sunday 22nd October. 6.30pm - 8.30pm.
Start point: Riverside Gardens, Cliff Road (B3135), Cheddar Gorge, BS27 3QE.
what3words///pavilions.thinks.throats.

Many events require booking and some have a small charge - please see the website for further details.
Please visit the Mendip Hills AONB website or scan the QR code for more information and to book onto an event:

- www.mendiphillsaonb.org.uk/events
- Somerset Earth Science Centre 01749 840 156

Brought to you by:

Mendip Hills Area of Outstanding Natural Beauty · mendip society · Somerset Earth Science Centre



Bath Geological Society Membership - 2023

We have a varied and exciting programme of lectures and guided trips for 2023.

The membership fees for the full year from January to December 2023 are:

Individual: £30

Family: £45

Student: £15

The easiest way of renewing your membership is via the website at;

https://bathgeolsoc.org.uk/membership.html

If you prefer, you can complete the standing order form from the download button at the bottom of the webpage and hand it to one of the Committee at one of our meetings, or post to the below address.

You can make a bank transfer using the details below.

Account name: Bath Geological Society

Sort code: 40-09-19

Account number: 71262556

Reference: BGS / [Your name]

Alternatively, you can post your cheque along with your membership form to the membership secretary: Ms Katie Munday, The Membership Secretary, 6 Lymore Terrace, Bath, BA2 2JL, or bring your cheque or cash payment with you to the next meeting at BRLSI.

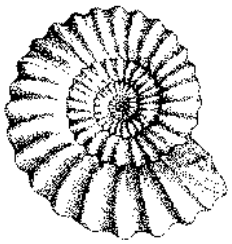
On behalf of the Committee may I thank you for your support and we look forward to meeting with you again.

Best wishes,

Katie Munday

membership@bathgeolsoc.org.uk
Bath Geological Society Membership Secretary

Bath Geological Society Newsletter November 2023



The evenings are getting darker and the year is ending, but here at the Bath Geological Society we still have a few more events and activities to keep our interest in geology going! During October we were treated to an excellent lecture entitled 'The Geology of The Himalaya Made Simple' the speaker was Dr Danny Clark-Lowes. The room in BRLSI was packed and together with the members watching online it was one of our best attended lectures of the year. For those interested in learning more Danny is the author of the geology guide to the Himalaya which was published by the Geologists' Association in November 2022 (GA Guide No 76)

The Bath Geological Society were invited, as an Affiliate member, to attend the Festival of Geology on November 4th 2023 in UCL which is organised by the Geologists' Association. I am very grateful to our members who made the journey into London to represent the society and take turns at our stand. Some photos and a short description are found on page 4.

In October we were also treated to a field trip led by Dr Nick Chidlaw to Cleeve Hill, near Cheltenham. Around a dozen members attended and learned about the stratigraphy of the Inferior Oolite. We enjoyed a cold but generally fine day until the drive home. A few photos from the trip can be found on page 5.

Our next lecture will be **Zoom only**, it will take place on **Thursday December 7th 2023 at 7pm.** The topic will be 'The NW Highlands Controversy' the speaker will be Dr Peter Gutteridge, University of Manchester. This newsletter carries the advert and abstract. Members will be emailed the Zoom codes ahead of the meeting, non-members can join via Eventbrite.

As we approach the end of the year, please consider writing an article for the 2023 Journal of the Bath Geological Society. If you see something inspiring to write about, please do so, articles have already started to arrive but we need more! Please send your articles and photos to Mell. journal@bathgeolsoc.org.uk .

The programme for next year is coming together we are working hard to have a varied and interesting geological programme. I value your support of the Bath Geological Society and trust you will want to renew your membership for 2024. Thanks to our Treasurer we are in good financial health and there will be no increase in the membership subscription.

Graham Hickman
chairman@bathgeolsoc.org.uk

In this issue:

Bath Geological Society lecture
Thursday December 7th @7:00pm

Title: 'The NW Highlands Controversy:
Geology, geologists, and social climbing in Victorian times'
Where: on Zoom.
Speaker: Dr. Peter Gutteridge, University of Manchester

Abstract: The NW Highlands of Scotland probably has the best scenery and geology in the world. You can find the oldest rocks in the British Isles, the first evidence of life, ancient landscapes carved out by Precambrian rivers and beautifully exposed Lower Palaeozoic clastic and carbonate sediments. These all-form part of a major fold and thrust belt on which the metamorphosed Moine schists were emplaced. However, geologist Roderick Impey Murchison saw this as a conformable succession. It is worth asking the question, why did Victorian geologists so completely miss evidence that is so obvious to geologists today? The answers lie in the state of geological science at the time, geopolitics, and social climbing. Resolution of the Moine thrust controversy was a turning point in the history of geology gave us the foundations of the science of geology as we now know it.

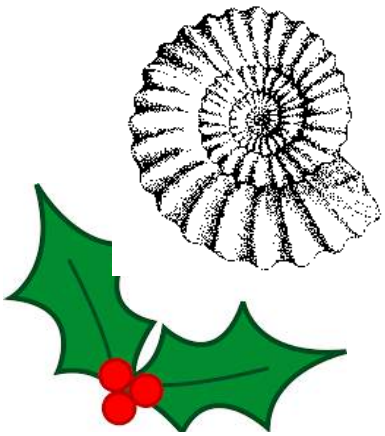
Please note: this will be a zoom only lecture

Lectures are **free to members**. We will email the joining instructions and the Zoom meeting info to members. £5 donation is requested from non-members and visitors via Eventbrite.

Get Tickets

https://www.eventbrite.co.uk/e/the-nw-highland-controversy-geological-social-climbing-in-victorian-times-tickets-745459889597

Bath Geological Society
December 21st 2020
@ 7:30pm
'Winter Social'



Please join us for an informal Xmas get together.

at ***The New Inn*** 7:30pm on Thursday 21st December

23-24 Monmouth Place, Bath, BA1 2AY

just a short walk from BRLSI.

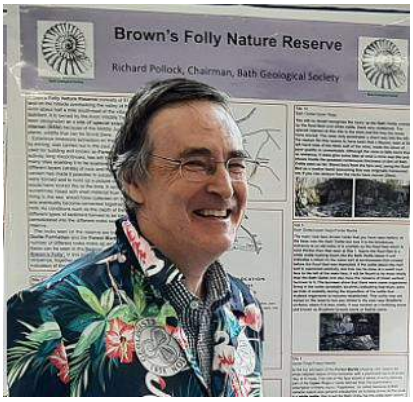
No pressure to participate, we just want to encourage those who would like to meet up for a drink to come and celebrate the end of the year.

P.S. Christmas market finishes on December 10th so hopefully parking will be returning to normal. Do let me know if you are coming and I'll be sure to look out for you. Graham 07763363266

Festival of Geology 2023 @ UCL

The Festival of Geology, which is organised by the Geologists' Association, is an annual event usually held on the first weekend in November. Geologists and local geological societies attend along with Rockwatch, the UK's Nationwide Geology club for Children. There are also commercial stalls selling rocks, fossils, minerals, jewellery, and books.

The Bath Geological Society, as an Affiliated Group of the Geologists' Association were invited to attend, and offered a table and posterboard to advertise our society. Four members of the BGS made the journey into London to attend and represent our society; Mell, Sue, Jules, and Graham.

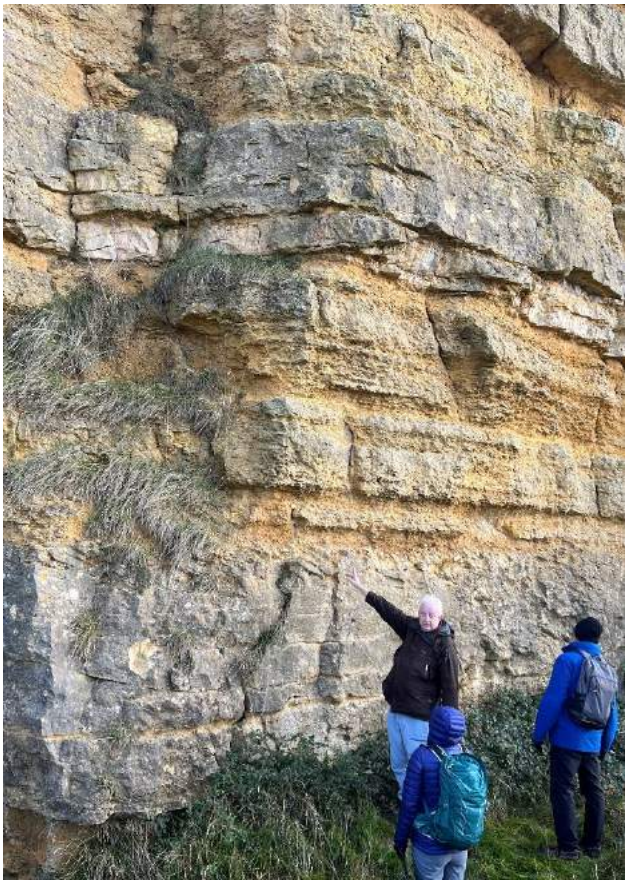


Throughout the day there were timed opportunities to attend a special exhibition of two of the world's oldest geological maps; a copy of William Smith's geological map (published in 1820) and a copy of Greenough's geological map (2nd edition published in 1839 held by UCL). Both were huge maps laid out on tables; the William Smith map is 2.6m x 1.8m whilst the Greenough map is 1.9m x 1.6m in dimension. Attendees were treated to a short history about each map, and their respective authors, and were then allowed a few minutes to examine the maps closely (without touching).

At 1pm Leanne Hughes from the British Geological Survey gave a talk about the 'Geology of Hogwarts' dressed as Professor McGonagall of Hogwarts she talked us through the geology seen at the various localities that appear in the Harry Potter films. She tied it all together with a geological map of Hogwarts! Look out for more detail in our Journal.

Cleeve Hill Field Trip, near Gloucester

On Saturday October 28th Dr Nick Chidlaw led our group from the Bath Geological Society around Cleeve Hill. Over the course of the day, we examined the full stratigraphy of the Inferior Oolite. Lunch was enjoyed at the Golf Club. A cold but generally fine day turned wet as we returned to the cars for the drive home as storm Ciaran arrived. We would like to thank Nick for sharing his time and experience to led this trip for us.



Nick pointing out the basal conglomerate of the Cleeve Cloud Member

Examining the pisolitic limestones at the base of the Crickley Member

Bath Geological Society - 2024 Members Evening.

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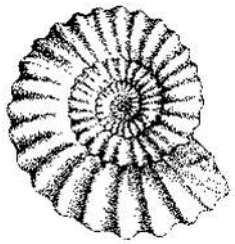
Bath Geological Society Membership – 2024



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On behalf of the Committee may I thank you for your support and we look forward to meeting with you again.

Best wishes,

Katie Munday

membership@bathgeolsoc.org.uk
Bath Geological Society Membership Secretary