

Down to Earth extra

Issue 136 April 2024



From the Editorial team...

What do you know about the geology of Greenland and Antarctica? I think that most of us would have to answer that with the retort "not a lot"! So when we decided to offer a Zoom talk on Antarctica and then subsequently added another on Greenland, it was a case of doing a lot of online research.

As this editorial is being penned we've done the talk on Antarctica and the one on Greenland is coming up. We have been amazed at the response to the two talks, with about 20 people signing up to each. Clearly there is great interest out there and it's pretty easy to see why. To start with both places have a very long geological history with their oldest rocks dating back to the Archaean of the Precambrian. Their respective oldest rocks date to around 3.8 billion years and point to some of the earliest continental crust, anywhere on Earth. Amazingly, there's even evidence for water.

After these early rocks, their respective geological histories diverge. In the case of Antarctica we see echoes of the geology of Australia, South Africa and South America, hardly surprising when you see the respective plate movements, particularly over the last 200 million years. In contrast the geology of Greenland mirrors that of Scotland, particularly that of the Northwest Highlands. A reminder, if one were needed, that we were joined until a little more than 60 million years ago.

I sure that I speak for both Colin and myself, when I say that we now know at least a little about the geology of these two great chunks of our planet and it will have been a pleasure to share that knowledge with some of you.

Chris Darmon & Colin Schofield
The Down to Earth editorial team

See pages 6-10 for details of our exciting 2024 programme of residential field trips!



World's oldest fossil forest found - in Somerset!

In recent years the north coast of Somerset, to the east of the small seaside resort of Minehead, has become an 'alternative Jurassic coast' for those who don't want to visit the more illustrious (and expensive) south coast of the county. For those geo-tourists, the coastline west of the town with its high Devonian cliffs were simply coastal scenery.

However a recent find by a team from the Universities of Cambridge and Cardiff have put these self same cliffs onto the world stage as the oldest fossil forest anywhere, by a margin of around 4 million years.

Dating to 390 million years, these predate the oldest previously identified which hail from New York state, USA. According to the University of Cambridge's website:

"The fossilised trees, known as *Calamophyton*, at first glance resemble palm trees, but they were a 'prototype' of the kinds of trees we are familiar with today. Rather than solid wood, their trunks were thin and hollow in the centre. They also lacked leaves, and their branches were covered in hundreds of twig-like structures.

These trees were also much shorter than their descendants: the largest were between two and four metres tall. As the trees grew, they shed their branches, dropping lots of vegetation litter, which supported invertebrates on the forest floor.

Scientists had previously assumed this stretch of the English coast did not contain significant plant fossils, but this particular fossil find, in addition to its age, also shows how early trees helped shape landscapes and stabilise riverbanks and coastlines hundreds of millions of years ago."



A reconstruction of a Calamophyton forest, where trees drawn measure 2-3 meters high. (Image: Peter Giesen/Chris Berry)

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Cliffs in Middle Devonian Hangman Grits, host the fossil forest. (Image: University of Cambridge)

Dr Christopher Berry, a Senior Lecturer at Cardiff University's School of Earth and Environmental Sciences who identified the fossils, said:

"These *Calamophyton trees* are the oldest fossil trees ever found in Britain and represent an as yet missing part of our vegetational history.

"The record of fossil forests, where tree bases are preserved where they were living, so far dates back to those discovered in New York State, at Cairo and Gilboa at about 385 million years."

The Cardiff University report continues:

"At first glance, the Calamophyton resemble palm trees, but were unrelated to the kinds of trees which populate Earth today. Rather than solid wood, their trunks were hollow in the centre with a ring of woody supporting strands around the outside. Instead of leaves their branches were covered in hundreds of twig-like structures.

The trees were also much shorter than their descendants, standing between two and four metres tall and as they grew, they shed their lower branches, dropping lots of vegetation litter, which supported invertebrates on the forest floor.



Up close, the remains are pretty impressive. (Image:Neil Davies, University of Cambridge)

The team also found evidence for bases of the trees, and their fallen trunks, demonstrating for the first time the environmental context and spacing of the trees while they were living.

Dr Berry added: "The shape and forms of these structures taken together strongly suggest that these the Calamophyton were standing alongside a raised bank beside a small river channel.

"I was able to identify the tree trunks based on 30 years studying these types of fossils and particularly having worked on the best and most complete specimens of Calamophyton from Belgium and Germany where they are well known but relatively rare.

Nevertheless, it was a bit of a shock. Having travelled the world in search of the earliest forests, it is amazing to know that you can see the localities from here on the South Wales coast."

The team says the North Devon and Somerset site was likely located much nearer Belgium and Germany in the Devonian period, before it was relocated along a huge geological fault during the Carboniferous period at a time of crustal compression and faulting when Africa collided with Europe.

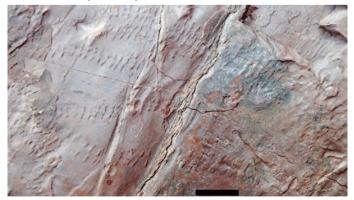


The field site, isn't all easy going, with the fossils on steeply dipping bedding planes.

(Image: University of Cambridge)

The study's first author Professor Neil Davies of Cambridge University's Department of Earth Sciences said: "The Devonian period fundamentally changed life on Earth. It also changed how water and land interacted with each other, since trees and other plants helped stabilise sediment through their root systems, but little is known about the very earliest forests.

"The evidence contained in these fossils preserves a key stage in Earth's development, when rivers started to operate in a fundamentally different way than they had before, becoming the great erosive force they are today."



A close up of the fossils. (Image: University of Cambridge)

The results are reported in the Journal of the Geological Society.

You can read an abstract from the paper here: https://www.lyellcollection.org/doi/abs/10.1144/jgs2023-204 YouTube video: https://www.youtube.com/watch?v=Sh5hz0XeBr0

BGS at Keyworth announces 2024 Open Day...

If you've never been to a BGS Open Day, now is your chance! BGS will be opening its doors of its headquarters, Keyworth near Nottingham, on Saturday June 8th.



This comes from the BGS website:

"Geology is all around us and integral to our modern lives in some unexpected and surprising ways. Come along to see some incredible rocks and fossils, and find out how we study these to protect against the effects of climate change.

We'll have a range of hands-on activities, tours and demonstrations to keep both young and old scientists busy, including landslide modelling, gold panning, tsunamis and the enthralling toilet roll of time! There will also be games to enjoy and, of course, the opportunity to meet our amazing BGS scientists, who are helping us to protect our natural environment. The programme will be wide ranging, with something suitable for everyone."

Bookings are now open. You can follow BGS on X (@britgeosurvey) for event updates using #BGSOpenDay.

Another 'very odd' creature comes out of China...

There was a time, about twenty years ago, when China became somewhat infamous for the number of 'very strange' fossils that came to the collectors' market that turned out to be fakes, where the fossils was an amalgamation of two genuine fossils. Now that the practice of fakery has largely ceased, we can cast our eyes on genuine 'very strange' Chinese fossils.

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An unusual present idea...

'The Cream of the Crop 2023'

As part of their work for Geo Supplies, your editorial team, Chris Darmon and Colin Schofield go to some very interesting places around the British Isles. Whilst they are in these places they often pick up rock specimens, most of which go to students and institutions both here and even around the world.

However there are also some rare or unusual rocks that don't form part of our regular stock and it is these that we've gathered together into a limited edition collection that we are offering as our 'Cream of the Crop 2023'.

The set comprises I2 carefully chosen igneous rocks from around the British Isles. They include The Foxdale granite from the Isle of Man, the Lundy Granite, Diorite from Guernsey, the Ailsa Craig Riebekite and Cumbraeite from Great Cumbrae. Each set comes boxed with notes and costs £49.95 including postage.

Purchase online at: www.geosupplies.co.uk or ring us on: 0114 245 5746.



The latest is a 240 million year old Triassic reptile that has been termed a 'dragon' by the press. It's actually *Dinocephalosaurus orientalis*, a 5-metre long aquatic reptile originally identified in 2003 in Southern China. In recent years more complete specimens have been found and an international team of palaeontologists including Nick Fraser from National Museums Scotland, have now published their findings.

This is what the National Museums of Scotland website has to say:

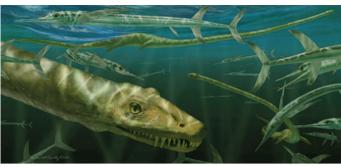
With 32 separate neck vertebrae *Dinocephalosaurus orientalis* had an extraordinarily long neck that draws comparison with that of *Tanystropheus hydroides*, another strange marine reptile from the Middle Triassic of both Europe and China. Both reptiles were of similar size and have several features of the skull in common, including a fish-trap type of dentition. However, *Dinocephalosaurus* is unique in possessing many more vertebrae both in the neck and in the torso, giving the animal a much more snake-like appearance.



The most complete of the specimens of Dinocephalosaurus orientalis shows how flexible it is.

(Image: National Museums of Scotland)

The reptile was clearly very well adapted to an oceanic lifestyle, as indicated by the flippered limbs and exquisitely preserved fishes in its stomach region. Despite superficial similarities, *Dinocephalosaurus* was not closely related to the famous long-necked plesiosaurs that only evolved around 40 million years later and which inspired the



A reconstruction of the animal based on the latest fossil finds. (Image: National Museums of Scotland)

myth of the Loch Ness Monster. The fossils were discovered in Guizhou Province, southern China.

Dr Nick Fraser FRSE, Keeper of Natural Sciences at National Museums Scotland said:

"This discovery allows us to see this remarkable long-necked animal in full for the very first time. It is yet one more example of the weird and wonderful world of the Triassic that continues to baffle palaeontologists. We are certain that it will capture imaginations across the globe due to its striking appearance, reminiscent of the long and snake-like, mythical Chinese Dragon."

Researchers from Scotland, Germany, America and China studied *Dinocephalosaurus orientalis* over the course of ten years at the Institute of Vertebrate Palaeontology and Palaeoanthropology, Beijing, part of the Chinese Academy of Sciences.

Professor Li Chun from the institute said: "This has been an international effort. Working together with colleagues from the United States of America, the United Kingdom and Europe, we used newly discovered specimens housed at the Chinese Academy of Sciences to build on our existing knowledge of this animal.

"Among all of the extraordinary finds we have made in the Triassic of Guizhou province, Dinocephalosaurus probably stands out as the most remarkable."

The paper describing the animal is published in full in the academic journal Earth And Environmental Science: Transactions Of The Royal Society Of Edinburgh – forming the entirety of the latest volume.



Down to Earth - in print...

If you've enjoyed reading this Down to Earth extra, you'll love our quarterly Down to Earth! It's a 32-page quality magazine in full colour that's packed with up to the minute geological news and articles. You can get your hands on this either in print or electronic formats. Why not request a FREE sample electronic copy of the current issue?

For 2024 why not treat yourself or a loved one to a gift subscription? Go to: www.geosupplies.co.uk and enter the online shop or ring us on 0114 245 5746.

Down to Earth is published quarterly. Subscribe now for 2024 for just £16.00 in the UK. We'll send you the next 3 issues, to the end of 2024 and 7 back issues from 2022/3. For an additional £25.00 (UK only) we'll send you a parcel of back issues around 50! Alternatively, take a 2023/4 e-subscription for £10.00. Additionally, all subscribers will get DtoE extra FREE each month.

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Extra April 2024





Scottish geology at its very best!

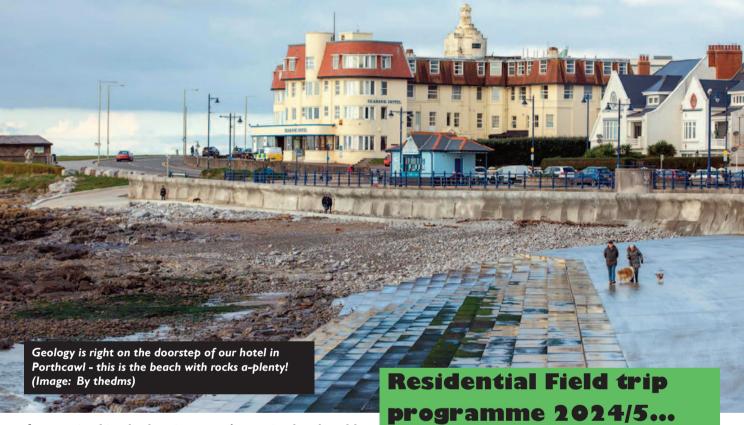
- 6 full days of field work with a choice on most days
- Edinburgh's Arthur's Seat volcano
- A visit to the Hunterian Museum in Glasgow
- Geology of Loch Lomond by boat
- Coach/minibus transport to field locations
- Full board accommodation in single ensuite rooms (can also be double rooms)
- A couple of evening talks from visiting speakers
- Social events and opportunities for down time

Everyone is invited to join us for our annual Summer School. The cost is £1295.00 per person sharing or £1450.00 single (no twin rooms). THIS TRIP CAN BE BOOKED ONLINE!

See the brochure, or book online at www.geosupplies.co.uk Email downtoearth@geosupplies.co.uk or ring us on 0114 245 5746 Geo Supplies Ltd 49 Station Road, Chapeltown, Sheffield S35 2XE

The learning zone

Great geo-adventures in 2024/5 begin here...



As promised in the last issue, we're excited to be able to offer trips to Cyprus, Arran along with North & East Iceland for 2025. The rest of the programme will be released in due course, but these three trips are open for bookings NOW!

For 2024, we do have limited availability on the trips shown opposite. To see a brochure visit our website at: www.geosupplies.co.uk or Tel: 0114 245 5746

Aside from the Summer School that can be booked via our website, for all other trips, booking forms are only available direct from us:

Email: downtoearth@geosupplies.co.uk

CONTACT US NOW!

- Geology of South Wales, June 23-30
- The Welsh Borderland, July 7-12
- Summer School Stirling, August 10-17
- Llyn Peninsula, Wales, August 31-Sept 5
- Jersey, Channel Isles, September 21-28 Full
- The Highlands of Scotland Fort William, October 4-14
- The Yorkshire Dales, October 21-26

2025

- Isle of Arran, March 30-April 6
- Troodos Mountains, Cyprus, April 24-May I
- Iceland, North & East Fjords, September 1-10

Early booking is advised, especially if you are looking for a single room.

Search online at www.geosupplies.co.uk or ring us on 0114 245 5746 Geo Supplies Ltd 49 Station Road, Chapeltown, Sheffield S35 2XE

The learning zone

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

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

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

Our 2024 programme...

With 2024 now well upon us, we are still taking bookings so you will not be surprised to hear that a number of trips are filling up fast - with several now full. Take our advice and make your bookings NOW! Remember that, for most trips, you can only get a booking form direct from us, they are not available on our website.

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

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

Brochure available online - booking form from us. We can accommodate more people in twin and double rooms.



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

The Welsh Borderland (5-nights) - July 7-12 £895
The English county of Shropshire and the adjacent parts of Wales

provide us with some of the most varied geology in the entire UK. We will be sampling rocks from the Precambrian right through to the Triassic with just about everything in between! There will be igneous plutonic and volcanic rocks, sediments galore and maybe even the odd metamorphic rock! There are fossils and minerals too - indeed something for everybody.

If you've never been on a geological field trip before then this is definitely one for you, as well as for the seasoned attender! Based at a comfortable guesthouse in the historic town of Bridgnorth, we'll be travelling around the area, including a trip on the Severn Valley railway.

Brochure online - get the booking form from us. This trip is now nearly full.



Permian rocks at Bridgnorth (Image: Wikipedia)

Summer School, Stirling (7-nights) - August 10-17 £1295

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

With all the usual elements that go together to make a great Summer School experience we'll bring you great geology with trips and study sessions combined with an enjoyable social experience.

Accommodation is in en-suite single and shared rooms in modern student flats.

Brochure available online. You can now book for this trip via our website, www.geosupplies.co.uk or get a booking form from us!



The Llyn Peninsula (5-nights) - August 31-September 5 £995

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

See the brochure online - get the booking form from us. This trip is already filling up.



The Welsh Highland Railway (Image: TripAdvisor)

The Fort William area (10-nights) - October 4-14 £1595

This is one of the undoubted highlights of the entire year. We've gone to the max to bring you a comprehensive 10-night itinerary based in this iconic Highland locality, at the comfortable Croit Anna Hotel.

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

See the brochure online - get the booking form from us.



Fabulous geology of the Lochaber Geopark.



The amazing Malham Cove - one of the highlights of the Yorkshire Dales National Park. (Image: Wikipedia)

The Yorkshire Dales (5-nights) - October 21-26 £895

Amazingly, we've never managed to base one of our trips in the Yorkshire Dales National Park. We had planned this trip for 2020, but it never happened due to Covid. Our base for the week is the small village of Gargrave, just to the west of Skipton.

From here we'll take in some of the highlights of the National Park, including the ancient rocks of Ingleton and Horton in Ribblesdale, the magnificent Carboniferous limestone with its show caves and the younger rocks of the Yoredales and the Coal Measures. We'll be venturing along the famous Settle-Carlisle railway to get a very different angle on the rocks and landscape.

It's the perfect way to end our field season.

The brochure for this trip is now available, booking forms from us!

Our 2025 programme...

We are already taking bookings for three trips during the coming year. Be aware, that there won't be as many trips as previously, because we have two private trips running for geologists from the USA.

With that in mind, we expect demand for the remaining trips to be strong.

We are working on a programme that will include, the Isle of Arran, South Devon, The Lake District, the Isle of Raasay, the Peak District, the North and East Fjords of Iceland and the Troodos Geopark of Cyprus. We apologise for the steep price rises that are a direct result of the increased costs of accommodation.

At this time we are now able to accept bookings on our first three trips, as detailed below. In all cases the brochures are ready for release and we are open for bookings.

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

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

The Isle of Arran, March 30- April 6 £1495

Arran has been described as the geologist's paradise. Why is this? Well it's a relatively small island most of which can be easily accessed from the coast road. Importantly for us, it's home to a wide variety of very different geology, with basement metamorphics from the Dalradian to a wide variety of different sedimentary rocks of Devonian, Carboniferous and Permian age. As if that wasn't enough, we can add in a Palaeogene granite with excellent contact metamorphism and more than a few basic dykes.



Hutton's unconformity at Lozhranza.

But that's not quite enough to give it such a high accolade. It also contains the first of three major unconformities found by James Hutton - this one he found in 1784. So it's firmly on the map of the founder of modern geology.

Arran is a popular island with all kinds of tourists, so it's important to find a good hotel. We've done just that, on the island's west coast at Blackwaterfoot, in the Best Western Kinloch Hotel. Here we get warm comfortable lodgings and excellent food, coupled with great customer service.

Troodos Geopark, Cyprus (7-nights), April 24-May 1 £1795

Come and join us as we visit the Troodos Geopark in Cyprus for the very first time. In the company of an experienced local guide and geologist we'll explore something of the magnificent geology of this great Mediterranean island.



The fabulous Troodos Geopark, where geology is at the heart of the landscape.

Five nights will be spent based at the Rodin Mount Hotel in the heart of the Troodos Geopark from where we will explore the rocks of this world renowned ophiolite complex. The final part of the trip will examine some of the sedimentary rocks from a second base in the

heart of old Larnaca. This is a great time of year to be visiting this upland part of Cyprus - do come and join us!

As this is a first for us, we know that demand will be high, so much so that we already have 12 people booked at this early stage. You are strongly advised to make an early booking.

Iceland, North & East Fjords (9-nights) September 1-10 £2895

It's more than 10 years since we last visited the North and East of Iceland. These are some of the most beautiful and remote parts of the country that escape the hoards of visitors who descend on the country during the peak of the tourist season.

In the company of our trusted guide and driver Ingi, we'll be travelling first to Akureyri and then on to Myvatn. This is a land of grand northward facing fjords where the ice left less than 10,000 years ago. Discover the warm hydrothermal pools of Myvatn and get fairly close to the volcano Krafla that has erupted in the past 50 years.



Down amongst the rhyolites of Borgarjordur Eystri with our guide Ingi, on our last trip to this area in 2013.

In the eastern fjords we'll be staying in the Geovillage that is Borgarfjordur Eystri with it's colourful rhyolite rocks and fabulous fjord setting. This is where the ancient origins of Iceland were first confirmed just a few years ago. The scenery of the East Fjords is truly breathtaking with some of Iceland's oldest and thickest basalt lava flows. We'll also be seeing some of crystals found around here, including a collection of zeolities.

We fly back to Reykjavik and Keflavik from Egilsstadir, where we give you the option of staying for an extra day of sightseeing in the Keflavik area, to see something of the very latest Icelandic volcanic activity.

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

Further 2025 trips will be released over the coming couple of months - you'll get to know first here in Down to Earth extra!

To get a booking form, or for additional information, email us directly at:

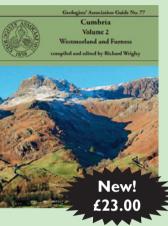
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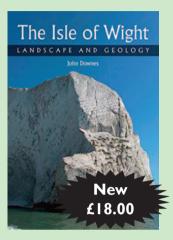


Featured books for April 2024

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













Original!

