Down to Earth *extra*

Issue 83 November 2019

SPOTLIGHT

- **2020 Worcester Summer School is available for booking!**
- **Norway - we need four more people!**
- **Autumn Day Schools vacancies**
- **Winter online learning**

The stunning landscape of the Llyn Peninsula of North Wales in the October sunshine. The picture was taken from the ultrabasic headland of Mynydd Penarfynydd looking towards the west and shows the varied rocks of the Peninsula. There are volcanics on Bardsea Island (back left) and the cliffs in the middle distance are composed of Arenig sediments and dolerite sills. (Photo: Chris Darmon)

From the Editorial team...

As we come towards the end of the field season, this is an opportunity to both look back and also to look forward to 2020. With the starting gun having now been fired for a General Election on December 12th, we seem to be entering yet another phase of uncertainty. What has this to do with us you might ask? Well, it seems to be affecting field trip bookings for 2020. We are still four people short of enough to run the Norway trip in April, for example. This would be ironic, because Norway isn't even in the EU, so nothing will change at all.

Looking back over 2019, it's become apparent that some of the severe weather we've been encountering is beginning to have an effect upon the landscape. A recent visit to the Llyn Peninsula shocked one of our readers. Chris Malone knows the area very well and was able to show us some dramatic changes that have occurred on some of the beaches as a result of recent storms. The Editor has a talk entitled "Iceland - where geological processes happen in real time" - well the same seems to be happening here now.

Also apparent in 2019, is the continuing decline in the quantity and quality of usable geological sites across the country. Vegetation seems to be on the march, covering up the rocks as it goes! As we've reported previously, this is even apparent in our National Parks which should be places where the landscape is pristine.

Against this background, it's good to be able to report on a newly accessible Permian outcrop that's nearly a mile long! As you can see in the news section of this ***extra***, it's at Clowne in Derbyshire and is a former railway cutting that's now a walking and cycle path. If only there were more examples like this one. Up and down the country volunteers will be spending time this Winter on geoconservation - why not join them?

Chris Darmon & Colin Schofield

The Down to Earth extra Editorial team

See page 6 for what's available for you to study this Autumn & Winter!

news update

Say hello to Greater Adria; Mediterranean tectonics has just got a lot more complicated...

Forget the lost continent of Atlantis, there's one far nearer and, what's more it's a place many UK holidaymakers know extremely well. Coined 'Greater Adria', the Greenland-sized continental fragment separated from North Africa about 240 million years ago (Ma), during the Triassic. An international team of scientists, led by Utrecht University in the Netherlands, have published their findings in the journal ***Gondwana Research***.

The fact that parts of Greater Adria can still be seen on the surface is testament to the complex tectonics of the Mediterranean region that has seen several collisions over the past 170 Ma and considerable anticlockwise rotation of the African plate.

Much of Greater Adria has been pushed into the mantle. But there's still some evidence in the mountains of Italy's Adriatic. Scientists have known of its existence for about 10 years, but, until now, did not know its precise shape and boundaries.

"Forget Atlantis," lead author Douwe van Hinsbergen of Utrecht University wrote in a blog post announcing the findings. "Without realizing it, vast numbers of tourists spend their holiday each year on the lost continent of Greater Adria."

Much of the lost continent formed in a shallow marine environment, not unlike the Mediterranean today. This limestone slab was slowly devoured as it sank back into the Earth's interior, driven by a plate collision, during the Cretaceous, between 130 and 100 Ma. As the late was subducted, some of the top layers of sediment were scraped off. It's these layers, that form the Apennines in Italy, considered to be a part of the Alps. Today, the only piece of Greater Adria that

The extent of Greater Adria, underlying more than 30 countries (Image: Utrecht University)

remains is a small strip from Turin in the north to Puglia in the south. The team used a digital imaging tool called GPlates, which allowed them to reconstruct movement of the plates in the region going right back to the Triassic. They then deconstructed the region layer by layer, until they were finally able to identify Greater Adria's location. Then, using seismic wave technology, they were able to measure its

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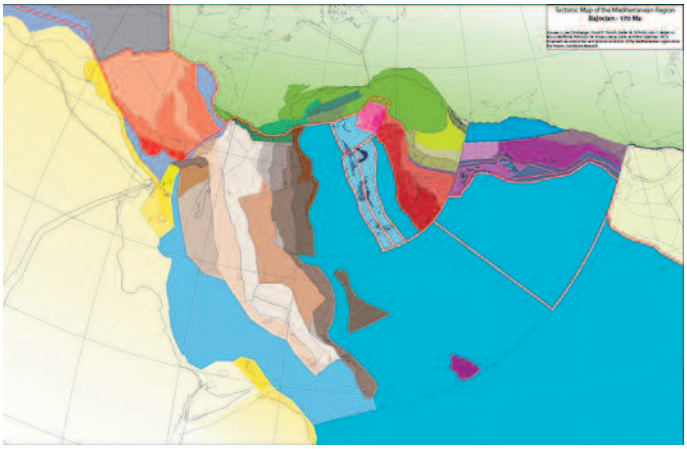
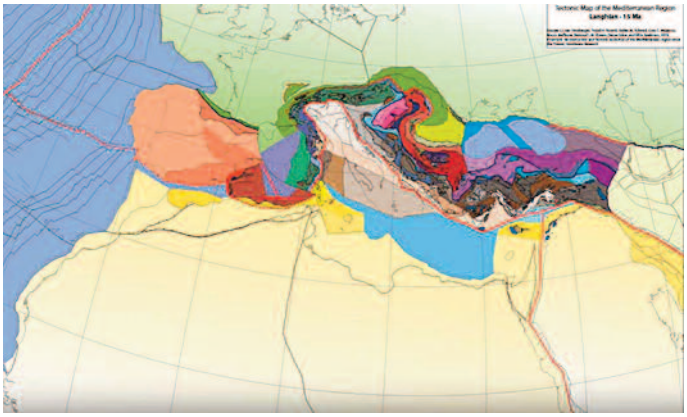
Editor: Chris Darmon
Assistant Editor: Colin Schofield

Tel: 0114 245 5746 • FAX: 0114 240 3405
Subscribe for FREE: *downtoearth@geosupplies.co.uk*

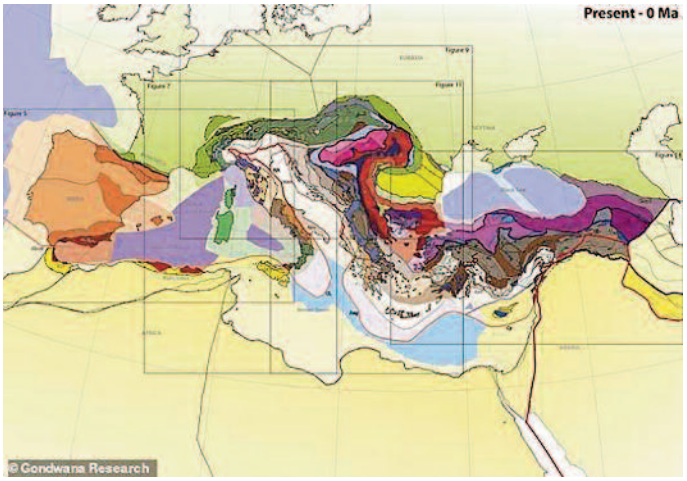
location down to a depth of more than 1,500 km. This is well below the depth that many people had previously considered for plate subduction and it adds to a growing body of knowledge of deep subduction around the world.



The Mediterranean region at 170 Ma - note the size of the sea area. (Images: Gondwana Research)



The same area, but this time at 15 Ma - much of the former sea area has gone, but the intervening period has been very active and complex, with most of Greater Adria destroyed.



The complex geology and tectonics of today's Mediterranean region is evident in this image.

Due to its size, Greater Adria, lies beneath more than 30 countries. This presented the research team with an immense logistical problem. "Each of these has its own geological survey, own maps, and own ideas about the evolutionary history. Research often stops at the national borders. Therefore, the region is not just fragmented from a geological perspective" said Douwe van Hinsbergen.

Cononish Gold Mine, Tyndrum reaches an important milestone...

Scotgold Resources have now complied with all 19 pre-start conditions set by the Lock Lomond and the Trossachs National Park Authority. They will now commence in earnest with the development of the Cononish Gold Mine and aim to pour the first gold before the year end.

Scotgold is now using new ionic leach techniques to conduct its exploration, as previous work had tended to indicate the huge potential of its ground without the company being able to pin down specific targets. According to Richard Gray, ionic leaching is a much

Inside Cononish Gold Mine (Image: Scotgold Ltd.)

more sensitive tool and more effective in the Cononish area than standard soil sampling.

The discovery of a project comparable in size to Cononish is a reasonable expectation, although the upside could be something much larger. The proof will come with drilling, and that will probably have to wait until production is well established.

New Permian exposure in Clowne is no laughing matter...

Clowne is a former mining village, a few miles east of the M1 motorway. It's close to the world heritage site at Creswell Crags, that's home to the largest number of Quaternary bones in the Northern Hemisphere.

Just beneath the streets of the centre of the village, in a railway cutting of the former Midland Railway lies a geological gem! The public now have free access to the former trackbed that's now a walking and cycle route, developed by Bolsover District Council. At more than 1km length, it has to be one of the longest exposures of the Lower Permian Cadeby Formation, anywhere in the country.

The clean lines of the Permian Cadeby Formation at Clowne can be seen in this view. (Image: Chris Darmon)

The cutting shows excellent joints that have been enlarged into solution holes, a couple of small faults and the opportunity to study more than 50 m of vertical Permian.

As a bonus, there are two extra bits of geology at the western end of the section. Just off the trackbed on the southern side there's a small exposure of the basal Permian Yellow Sands where the cement has been dissolved away, leaving soft loose sand. Finally, about another km further to the west there's a trackside exposure of more than a metre of coal, the Clowne Seam.

The Clowne Coal is more than a metre thick beside the railway. (Image: Chris Darmon)

Ironically, the railway line, that was last used in the 1960s, was mothballed for many years pending a decision on working the Clowne Coal by opencast, with an estimated reserve of more than 500,000 tonnes. This proposal was abandoned in the early 2000s.

The Editor comments: *Given that we are losing geological exposures for all kinds of reasons, it's good to be able to bring you a positive story with real field benefits.*

Saving Charles Lyell's notebooks for the nation - together we did it!

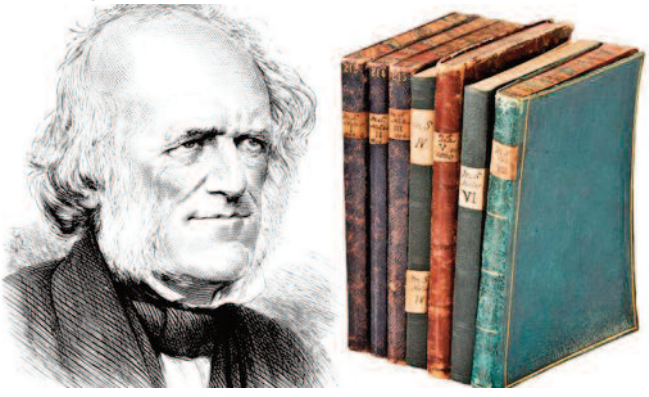
In the last ***Pygidium*** we told you about the campaign to save Charles Lyell's field notebooks for the nation, after they were threatened with being lost to an overseas buyer. The University of Edinburgh has been in the vanguard of the appeal and the University's David McClay provides this update as this issue closed for press:

"Thank you for your support or interest in the University of Edinburgh's campaign to raise the funds to Save Charles Lyell's notebooks.

Thank you! Together, we did it. Charles Lyell's 294 notebooks were

due to be sold abroad. However, a temporary export bar was imposed, giving the University of Edinburgh and supporters the opportunity to raise the necessary funds to purchase them.

Over 1,100 supporters pledged to save the historic notebooks. The purchase price was originally set at £1,444,000, but reduced to £966,000 thanks to a restructuring of tax liability. With the full funds now pledged, we have to gather in these generous gifts to allow the purchase to go ahead."



Charles Lyell and a few of his notebooks
(Image: Courtesy of Edinburgh University)

So if you pledged a sum of money to help save the notebooks for the nation, now is the time fulfil that pledge. That the appeal has been so generously supported by individuals, institutions and groups up and down the country is amazing, but why was it so important? Here's what Professor Charles Withers of Edinburgh University and Professor James Second of the University of Cambridge have to say:

"Charles Lyell's importance as a world-leading scientist is unquestioned. His remarkable notebooks are key to appreciating his standing as arguably the most significant figure in the earth sciences in Britain in the past two centuries. They illuminate our understanding of the nineteenth century, and shed light on contemporary concerns including climate change, species diversity and the meanings of deep time. We are delighted that the University of Edinburgh's efforts together with the generous support from many donors and different institutions to save Lyell's fascinating notebooks has been successful and look forward to these being made public."

It is the intention of Edinburgh University that Charles Lyell's notebooks will go on public display and will be accessible both to the general public and to researchers. They will be making announcements as and when decisions have been taken, but first and foremost we must celebrate this excellent news!

If you enjoy reading your *Down to Earth extra* - why not sample it's big brother' - free of charge!

We've now been publishing ***Down to Earth extra*** for nearly seven years. Over that time the circulation has steadily grown and today we estimate that it's read by moe than 3,000 people across the UK and even overseas! But you can get your hands on a lot more geo-news, articles and so much more by subscribing to our quarterly magazine ***Down to Earth!***

For a FREE e-copy, email: downtoearth@geosupplies.co.uk

learning zone

Autumn Day Schools are here...

During November and December we'll once again be running a programme of Day Schools in venues around the country. If you've not joined us on one of these before, what can you expect.?

For the first time, we're running a couple of experimental events in the West Midlands which feature some classroom work and also a couple of local rock outcrops. These are particularly aimed at people who are beginning to get acquainted with rocks and the landscape - ***see below for more details***.

Our other Day Schools follow our familiar pattern of being entirely indoors. They are a mixture of hands-on practical work involving specimens and images and also some stimulating teaching with videos. These are aimed at a wide audience from the beginner though to those with more knowledge and experience. All day school venues offer hot drinks and biscuits and others will provide us with a full lunch buffet - ***see below for details.***

Wednesday, November 6 Shropshire
How do we read rocks & landscape?
This inside/outside day is aimed particularly at those for whom reading rocks and landscape is something new, although all are welcome. There will be an indoor session in the morning, followed by lunch in the cafe (at your own expense) and then we'll take a stroll to see some local rock outcrops and take in the wider landscape.
Meeting: Severn Valley Country Park, Highley, Shropshire at 10.30 Cost: £10.00

Wednesday, November 20 Wiltshire
How the Earth works, new views of an old planet
An exciting day that starts with an examination of our planet through its rocks and minerals and then moves on to peer inside to see how it is constructed, before moving on to examine how our understanding of how it works has changed radically in the last 100 years. From a rigid cooling body of the past, to a mobile, highly active Earth that we perceive today. There will be hands on practical work and several video presentations. Includes full buffet and drinks.
Meeting: Devizes Conservative Club at. 10.30 Cost: £35.00

The Commercial, Chapeltown - home of geology, good beer and food!

Wednesday, November 27 Worcestershire
Rocks of all kinds explained!
How do we distinguish different rocks? What's the difference between a granite and basalt, or a slate and shale? This inside/outside day will combine a classroom session with an outdoor visit around Bewdley where we'll be able to see natural rocks 'in the street'. There's an onsite cafe where you can buy lunch. This day is aimed particularly at beginners, but all are welcome.
Meeting: Bewdley Museum at 10.30 Cost: £10.00

Saturday, November 30 Newcastle upon Tyne
How the Earth works, new views of an old planet
See Devizes above, for details of this course. At this Central Newcastle venue, only hot drinks and biscuits are included in the price. ***Meeting: Central Newcastle at 10.30 Cost: £25.00***

Saturday, December 7 Sheffield
Rockstars, a celebration of famous rocks
There are some rocks that everyone has heard of, like Portland Stone or Shap Granite. But why are they famous, what makes them so special? We'll be examining some famous rocks in a practical session and then learning more about them in a lively teaching session during this day of two parts. Included in the price is a hot and cold buffet lunch and hot drinks.
Meeting: Commercial Inn, Station Road, Chapeltown Cost: £35.00

Wednesday, December 11 Birmingham
Rockstars, a celebration of famous rocks
See Chapeltown above for details of this course. At this venue only hot drinks and biscuits are available.
Meeting: Lapworth Museum, Birmingham University at 10.30 Cost £20.00

Saturday, December 18 Hertfordshire/North London
How the Earth works, new views of an old planet
See Devizes above, for details of this course. At this venue, hot drinks and lunch are included in the cost.
Meeting: YHA Lee Valley, Cheshunt, Herts. at 10.30 Cost: £35.00

Winter Distance Learning Courses are here

Commencing in mid-January we'll be running a variety of distance learning courses. They run for around 10-weeks and all cost £75.00 in electronic form (either email of via the Moodle platform) or £100.00 in paper form. You can enrol by entering the online shop at: www.geosupplies.co.uk or by ringing us on 0114 245 5746 (Enrol from mid-November)

For January 2020 we'll be offering:

"Geology of the British Isles" - a detailed look at the geology of our country taking each period in time (13-weeks).

"Sedimentary rocks" - takes in the rocks and the process that shaped them. It's a while since we offered this, so why not take us up on the offer? (10weeks).

"Steps towards the Rock Face" - is our beginner's course that covers a wide range of geological topics, from plate tectonics to rocks, minerals and fossils. This is available 'on demand' to commence at any time.

Further information on all courses is available by emailing: downtoearth@geosupplies.co.uk or ring: 0114 245 5746

Our Residential Field Trip Programme for 2020

A dramatic view of a larvikite quarry in Larvik, Norway (Photo: Chris Darmon)

We are now well on the way with our bookings for 2020, with several of the trips being fully booked. We have now finalised our Summer School which will be based at the University of Worcester in August and have also found suitable accommodation close to the Forest of the Dean.

Several trips are now fully booked and others are getting down to the last few vacancies, so make sure that you book up soon!

If you are looking for single rooms, then we have plenty of availability on the July trip to the Western Lake District and the Summer School. Due to a late cancellation we have one single for Portugal.

For further details, visit the website or Tel: 0114 2455746.

Booking forms are only available direct from us. Email: downtoearth@geosupplies.co.uk

The complete 2020 field trip programme...

- Terras de Cavaleiros, Portugal - March 13-20
- Norway revisited - March 27 - April 5
- Raasay & Skye - April 25 - May 2*
- Eigg & Rum - May 3-12*
- Dingle Peninsula - May 31 - June 7
- Shetland Isles - June 20-27*
- Western Lake District - July 4-11
- Summer School - July 25 - August 1
- Pembrokeshire - September 1-8
- Isle of Arran - September 14-21
- Forest of Dean - September 27 - October 1
- The Yorkshire Dales - October 6-11
- The Malvern Hills - October 23-28

*Trips marked * are now fully booked.*

We look forward to hearing from you!

Down to Earth

"Earth science learning for all"

Come and join our fourth Summer School...

Worcester Summer School August 15-22 2020

The Devil's Chimney, Leckhampton Hill, Cotswolds.

St John's Campus, University of Worcester

Worcestershire is at the very heart of England - and perfect for geology...

Our Summer School journey has so far taken us to the Lake District, Shropshire and then last year to the Peak District of Derbyshire. Each venue has allowed us to study some very varied geology and to put on an exciting programme with mix of field trips, indoor talks and social activities. So for 2020 we are heading for the City of Worcester, specifically we're based at the St Johns Campus of the University of Worcester.

It's the perfect base from which to explore the amazingly varied geology within a 50 mile radius of the city. This can encompass the Precambrian rocks of the Malvern Hills, the amazing sites in the Worcestershire village of Martley, the Devonian and Carboniferous rocks of the Forest of Dean, the Triassic and Jurassic rocks of Aust Cliff and splendid scenery of the Cotswolds. For those looking for something a little more gentle we can offer geology in the historic city centre of Worcester, including its magnificent cathedral and even a visit to the Lapworth Museum in Birmingham. If you are looking for something a little more unusual we can offer a day trip on the Severn Valley railway with a geo-walk along the way.

We'll be offering single en-suite rooms (there may be a few twin/double rooms) on the St. John's Campus which is around a 15 minute walk from the city centre. Here, we'll be taking breakfast and evening meals and have our Summer School talks. As is usual on our Summer School, there will be a full programme of evening talks and activities with some outside speakers. It promises to be enjoyable, educational and fun! Early booking is strongly advised.

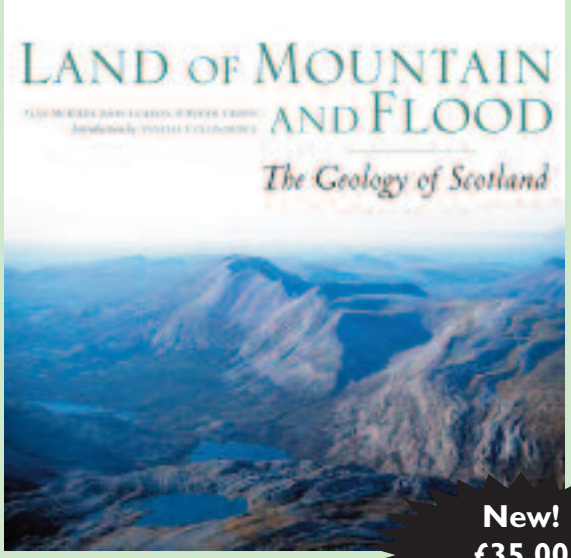
Chris Darmon & Colin Schofield

View the brochure online at: www.geosupplies.co.uk
Email for a booking form: downtoearth@geosupplies.co.uk

GEO Featured books November - January

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 the month shown above, provided that stocks are available. Please note, all prices include UK postage.

New! £18.95



New! £35.00 hardback

New! £11.00

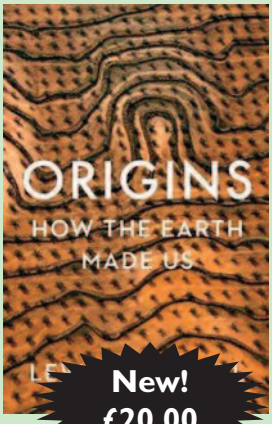
Including a folded copy

New! £19.95

New! £19.95

Bedrock UK Geology 1,000 piece jigsaw - includes a folded copy of the map!

New! £15.00



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