



**The newsletter of Malvern U3A Geology Group  
October 2016**

**The leader**

Can you believe that we are starting our winter programme of lectures with total confusion over meeting timings! I hope that by now you have all realised that despite some chopping and changing our next meeting on 12<sup>th</sup> October will take place at the normal time of 10.00 am! Rosemary Dartnall is speaking to us on the geology of Anglesey, which I know will be a real treat. Rosemary lead both of our trips to Anglesey and Bude and has a lovely way of explaining difficult concepts.

Since the last newsletter, the field trip to Bude has taken place. It was a most successful trip which I'm told stretched the brain in some interesting ways! I look forward to a full briefing in due course. As I have already mentioned, the trip was lead by Rosemary Dartnall for which we are most grateful but a huge thanks must also go to David and Gwyneth Adams for all the administrative work that they put in to make the trip such a success.

On the subject of residential trips, we have had a very good response to our plans for a field trip to South Pembrokeshire next May. We have a little over 20 signed up already and there are 3 or 4 double rooms still available should we need them. If there is anyone who is still considering signing up, may I encourage you to let Sue Munday ([suederrick21@gmail.com](mailto:suederrick21@gmail.com)) know as soon as possible as this will allow us to get the best possible price deal.

The new members' sessions have started with around 20 turning up for the first meeting last week. The details of the other sessions are shown in the Calendar section below. 'Old' members are very welcome to attend, please contact Hilary Edgeley if you are interested. We look forward to welcoming our new members to the first full meeting of the group in October.

Finally, in case you missed it there is a very good series on Channel 4 called "Walking Through Time". This is well worth watching, follow this link for details - [Walking Through Time](#).

## Fossils

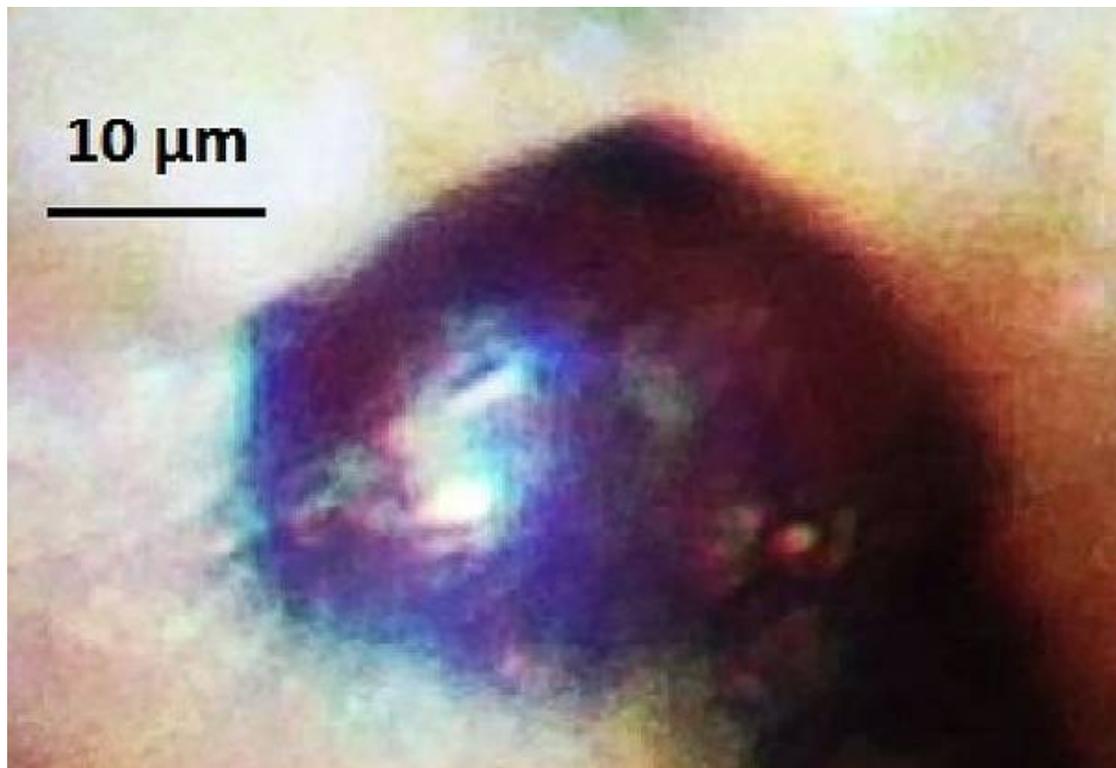
Looking back over our newsletters, you might get the impression that we have been a little neglectful of this subject, so this edition is devoted to the subject. Your Editor used to live in the delightful city of Lichfield, which you will no doubt recall, is the birthplace of many notables, including Samuel Johnson, the man who spent many years producing the first dictionary. He defined fossils like this:

**Fo'ssil. n. s.** In this globe are many other bodies, which, because we discover them by digging into the bowels of the earth, are called by one common name *fossils*; under which are comprehended metals and minerals.  
*Locke.*

Well in the last 250 years our understanding has moved on somewhat from there, so read on and find out.

## How big?

Fossils are very variable – in age, in size, in location and type of material represented. Take for example size. Below is what must be one of the smallest microfossils, a proterozoan from Gabon. It is 25 millionths of a metre across, which probably accounts for the rather fuzzy quality of the image.



Moving upscale rather a lot, we find this quite splendid example of an ammonite from the Jurassic rocks of Dorset. It would have been quite a shock to come across this beast whilst quietly going about your business!



But even this hefty specimen pales into insignificance when compared with some dinosaur fossils. They are not all enormous of course, but the largest are on a truly impressive scale.



This femur belonged to a Titanosaur and is 2.4m long, which gives the animal itself an estimated length of 40m and weight of about 100 tonnes. It lived in the Cretaceous period in what is now Patagonia, which seems to be a hotspot for giant dinosaur remains.

### How old?

There seems to be a vague consensus that the time taken for material to be fossilised is around 10,000 years. In the great scheme of geological history that's not very long, after all humans and other mammals have been around for much longer than that. Thus we have a situation where we can find animals both in the fossil record and in the biota. The photograph below of a Ph. D student and a shark toothed dolphin, neatly illustrating that.



Moving on now to the other end of the time scale, there are some really big numbers. Recent work at Isua in Greenland has pushed back the date of the earliest life by 220 million years to 3.7 billion years. The fossils in question are Stromatolites, layered bio-chemical accretionary structures formed in shallow water by the trapping, binding and cementation of sedimentary grains by bio films (microbial mats) of micro-organisms, especially cyano bacteria.



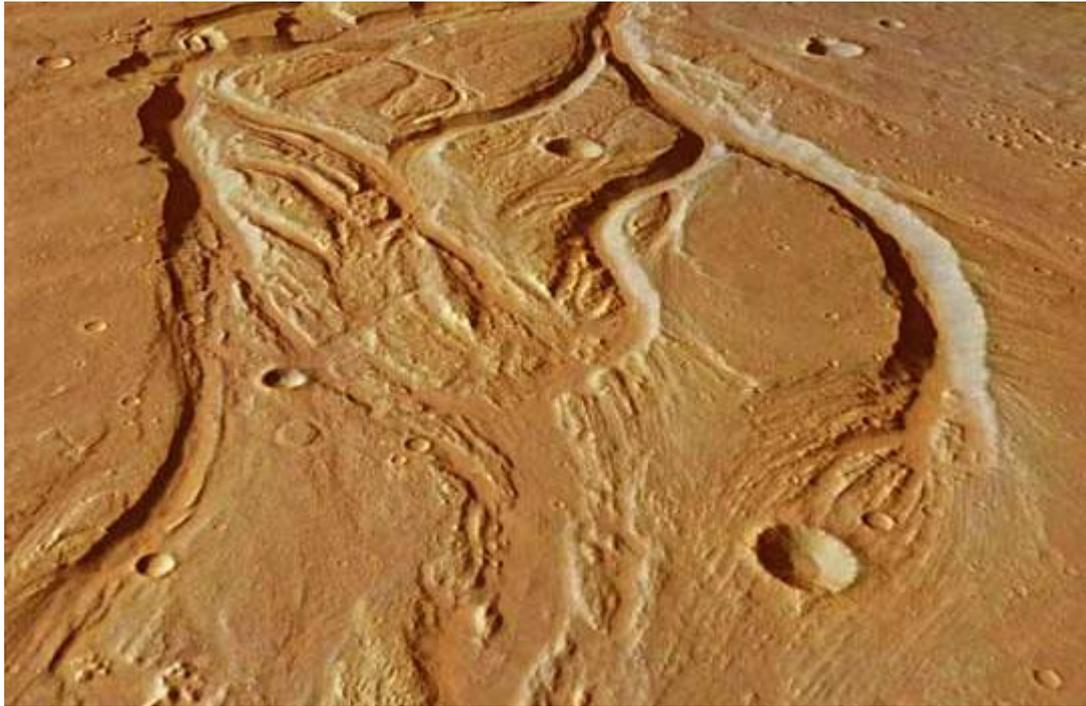
Living stromatolite colonies

Remarkably, they still thrive today at Shark Bay in Western Australia. The fossil versions look rather different, but are being viewed in cross section.

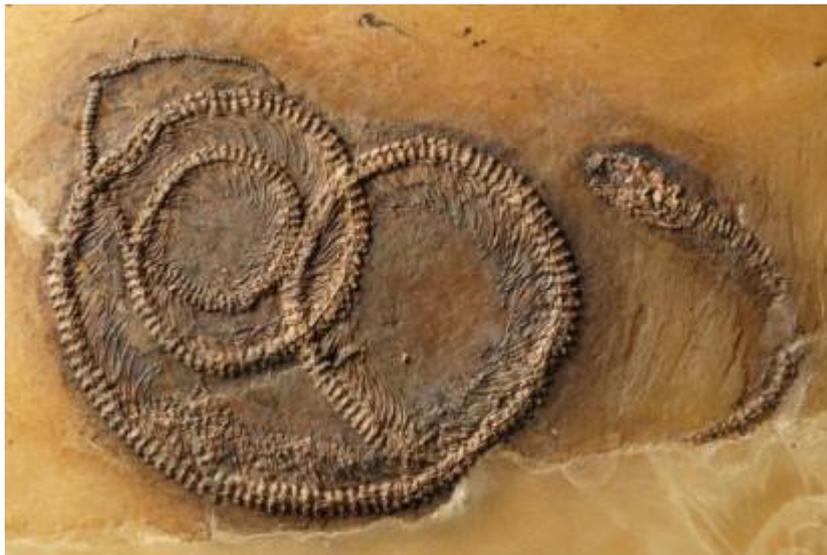


The stromatolites are the brown triangular and rounded features. There is a diminishing probability that older fossils will ever be found. Rocks from this period are very rare. Those that survive have been heated to such high temperatures by geological processes like subduction and mountain-building that evidence of fossils and sedimentary layers is destroyed. Most of the Isua rocks have been metamorphosed in this way.

To finish this section, let's return to the size of fossils. Even large scale geomorphological features can become "fossilised". Raised beaches and sea cliffs that are some distance inland can be cited, but the example shown below is also on another planet – Mars. The area shows fossilised river channels; clear proof that the planet was once both warm and wet.



**And a very rare oddity**



This is the recently discovered fossil of a snake that has eaten a lizard that has eaten a beetle. It was found in the Messel Pit which is near Frankfurt and which has produced many rarities.

**You'll be well aware.....**

..... that we have a Fossils sub-group. And when it was decided to devote this edition to fossils, it seemed reasonable to ask them for a contribution. It was Lucy Cornelius who came up with two splendid articles, one on Crinoids and the other about Graptolites: she was followed by Sue Benjamin who writes

about Ammonites. To avoid making our email too large we are making these articles available as separate files. Enjoy.

If after reading this, your interest in fossils has been piqued, then Christopher Wright is the person to contact – you'll find his details in the **Who's who?** section below. You'll also find a good range of interesting publications in our Library that are available for loan.

### **Now why didn't this happen last month?**

An announcement this week about a meteorite find – and weighing in at over 30 tonnes. So if you had been around, you would certainly have noticed its arrival! It is the latest find in the Campo del Cielo meteorite field. Follow the link for more information.

<http://www.amusingplanet.com/2016/08/campo-del-cielo-meteorite-field.html>

and another one rather nearer to us:

<http://www.bbc.co.uk/news/uk-scotland-highlands-islands-37360696>

Ancient earth was clearly a very dangerous place!

### **Calendar**

October	5	<b>New Members - Geology of the Malvern Hills</b>
	12	Monthly Talk: Geology of Anglesey
	19	<b>New Members - Geological Time</b>
	26	<b>New members - Plate Tectonics</b>
November	2	<b>New Members - Rocks, minerals and fossils</b>
	9	Monthly Talk: Ancient Subduction Zones in the UK
	23	<b>New Members - Tank Quarry and Whitman's Hill Quarry</b>
	30	<b>New Members - Gullet Quarry</b>
December	7	<b>New Members - Building Stones of Worcester</b>
	14	Monthly Talk: Historical Large Scale Volcanism and Future Risks
January	11	Monthly Talk: East African Rift Valley
February	8	Monthly Talk: Use of Stalagmites in Geology/The Anthropocene
March	8	Monthly Talk: What's Underneath a Volcano?
May	5	South Wales (until 9 <sup>th</sup> )
September	19	Brittany (until 28 <sup>th</sup> )

## Who's who?

### Steering Committee

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### Group website

## Malvern U3A Geology



<http://geology.malvernu3a.org.uk/>