

# CHARNIA



Newsletter of the

## Geology Section

of the Leicester Literary & Philosophical Society

[www.charnia.org](http://www.charnia.org)

SEPTEMBER 2016

## Paying your subs at meetings

### NEW ARRANGEMENTS

To avoid queuing and to ensure the talks start on time (and to make the membership secretary's life easier) we are changing the way subscription payments are accepted:

Only **an envelope** containing

- the form
- payment (cash or cheque)

will be accepted.

You can then collect your membership card/programme at the next meeting, or - *if also include a SAE in the envelope* - posted to you.

Members who pay by Standing Order will be able to collect their membership card before the talk, as now.

Payment by post is not affected.

Many thanks

*Fiona Barnaby*

Membership Secretary

Payment by Standing Order makes life easier for everyone. If we can tempt you to sign up (if not done already), a Standing Order mandate is now part of the membership form, which is included with this issue of *Charnia*.



**COVER:** Old Cliffe Hill Quarry, Markfield, in 1975. Who thought then that this would become such an important locality for understanding the diversity of the Charnwood Ediacaran fauna? See Helen Boynton's piece on p. XX.

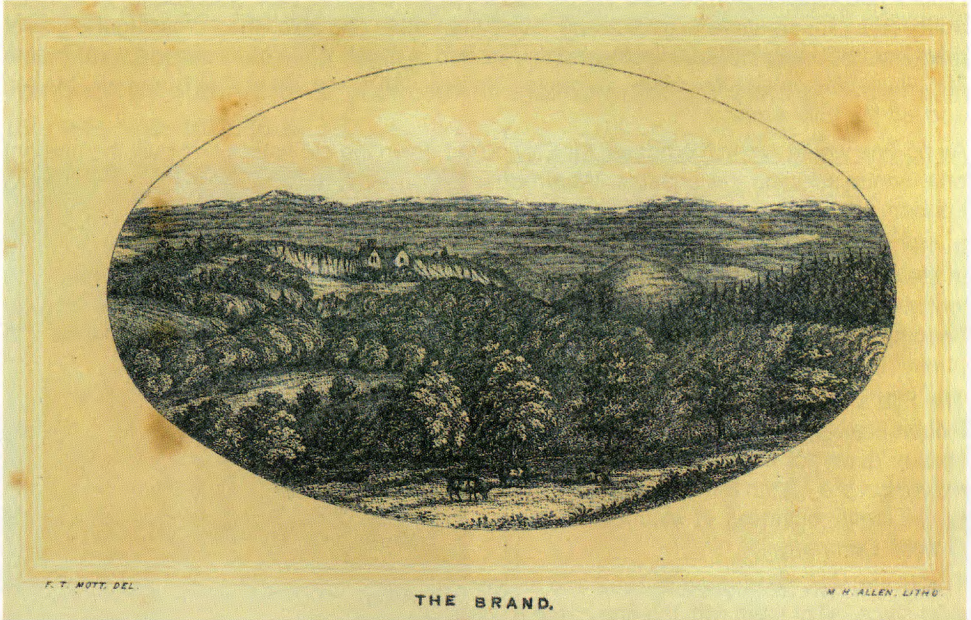
**Photo © BGS.** Image P008048 from the online resource GeoScenic, taken in January 1975 by Dr C J Jeffery

## The Martin family and The Brand

### Robert Martin

The Martin Family have been long-term residents of Leicestershire, but have only relatively recently moved to Woodhouse Eaves. The first recorded Martin was John, a wool merchant in Leicester, in the 12<sup>th</sup> century. Since the reign of King John (1199-1210), members of the family have been Freemen of the borough, now city, of Leicester, and remain so today. Earlier Martins have over the centuries regularly been Mayors of Leicester, Justices of the Peace, Members of Parliament, High Sheriffs and various roles within the Lieutenancy.

As with any family there was the odd 'black sheep'. In 1263 Nicholas Martin was fined 4



shillings by the Gild for selling bad wool mixed with good; an offence he repeated 15 years later. In 1301 Robert Martin was charged with conspiracy and trespass and in 1314 another Nicholas Martin was slain in a brawl with some men from Wigston near St Margaret's Church in Leicester. Sometime in the 14<sup>th</sup> Century the family moved from Leicester to Anstey, where they still farm today.

The last family home in Anstey was Anstey Pastures, which was situated on the ridge above Gynsill Lane, looking north out over the valley towards the village, an area now covered by the Beaumont Leys estate. Robert Frewen Martin (1842-1912) sensed that Leicester was going to expand and determined to move further into the countryside.

The Brand was bought by the Ellis Family around 1850. The house was so called as it was built in a clearing, one of three places used by local farmers to brand their cattle, which before the enclosures, were left to roam freely around the area of Charnwood Forest. When the Ellis family bought The Brand, the house was on the West side of the ridge looking northwest over the valley towards Maplewell and Roecliffe. The Family lived in Leicester, but visited the house at weekends and in the summer; meanwhile the Brand was lived in and maintained by Mr and Mrs Hincks.

In about 1877 Mr Hincks had been working in the kitchen garden. When returning to the house he saw a tall woman, dressed in dark clothes, approaching the house. He watched her cross the lawn, and pass out of sight towards the front door. He hurried that way, but the porch was empty and front door locked. His wife has neither seen nor heard anything.

Some days later Hincks saw the woman again, and, determined to find out who she was, he moved to intercept her. Once again he could find no-one. Some two weeks later, and by now thoroughly alarmed, Hincks was returning home, this time accompanied by his wife. They both saw the dark lady and resolved to establish who she was. They split up to approach her from different directions. Again they could find nobody.

Hincks had noticed several odd things about the woman. No face was visible, or at least noticeable. She seemed to glide along rather than walk, and also when crossing the gravel drive made no sound. Mrs Hincks took to her bed in fright, while her husband went to see Mr Ellis at his home in Belgrave, Leicester. He declined to remain at The Brand any longer, and left the Ellis' employ.

As no-one would live in the house, Mr Ellis pulled down the old house and built the present one, commissioning the architect Waterhouse, who also designed the Albert Memorial in London.

In 1879 Geoffrey Ellis inherited the estate on his father's death, and in 1880 was working in the Smoking Room, now the study, and the very same room in which this article is being written. A woman's figure, dressed in black, passed by the porch and in front of the window, heading round the corner of the house towards the garden. Mr Ellis immediately went in pursuit but found nobody.

The Ellis's decided to move back to Leicester, and in the late 1880's my great grandfather, Robert Frewen Martin, rented the Brand, when he was contemplating the move from Anstey. History does not record whether he was aware at the time of the reasons for the Ellis's move, but the Martin family loved the house and its gardens and it was conveniently close to the family business at Mountsorrel, where they owned and operated the Mountsorrel Granite Company.

The Brand was purchased in 1892 and successive generations of Martins have lived here ever since, all of them with the first name Robert. To avoid confusion, alternate generations are called by their second name. Thus my father was known as Andrew, and my son Edward.

The Brand remains as beautiful as ever, although perhaps not quite as well maintained now outside the Victorian cast iron fence, which contains the gardens immediately around the house, as it was in the time when some 14 men were employed to do it. As one of the first Sites of Special Scientific Interest in the county, the wild part of the garden, some 43 acres, has witnessed generations of geologists and other scientists, who have studied and recorded rocks, plants, birds, fungi, moss, ferns, lichen and numerous other flora and fauna. With prior permission The Brand is also used by climbers, scouts, guides, and others who enjoy exploring a relatively untouched and peaceful part of Charnwood Forest.

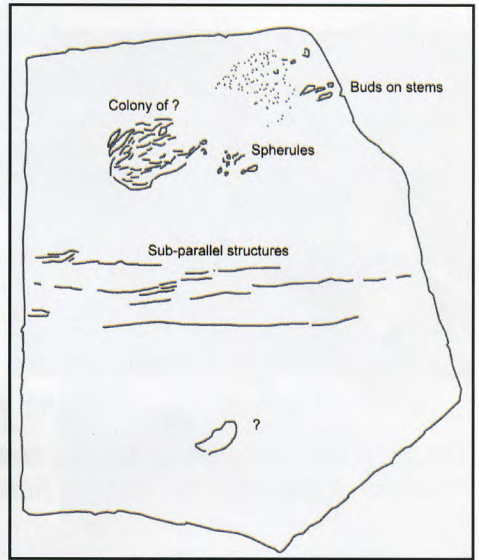
*Robert Martin, July 2016*

## More fossils from Old Cliffe Hill Quarry, Markfield

Helen Boynton

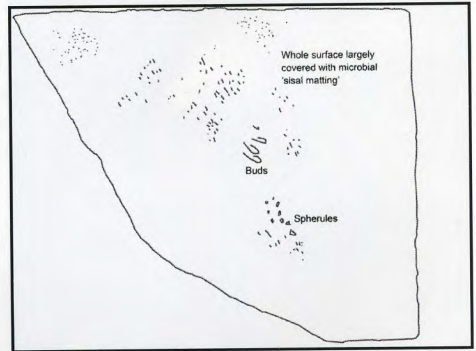
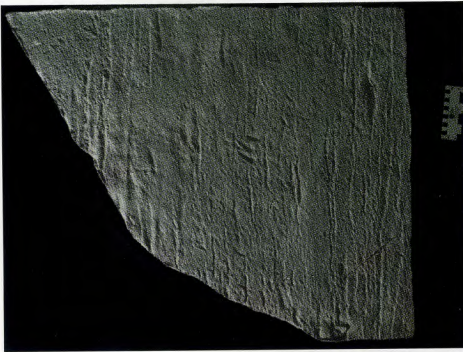
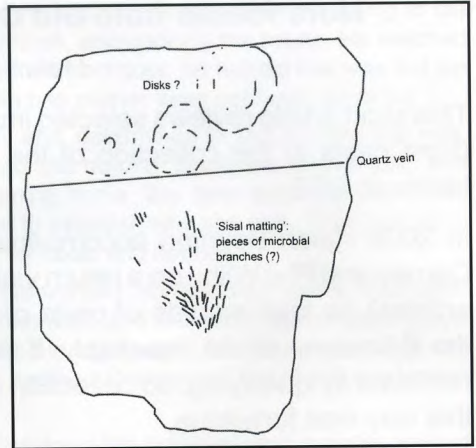
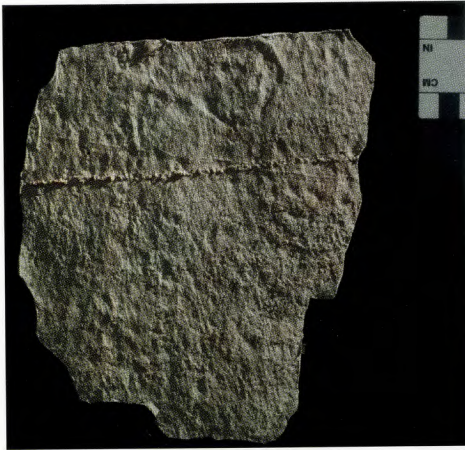
This short article reviews selected images from a set photographed recently (from casts in the collection of the British Geological Survey) by Simon Harris at BGS.

In 2009 Helen Boynton accompanied BGS personnel Mike Howe, John Carney and Phil Wilby on a return visit to Old Cliffe Hill Quarry (see previous articles), to take moulds of parts of a recently-exposed bedding plane in the Ediacaran strata. Inevitably, if sadly, these outcrops have since been removed by quarrying, so collection of this potentially important material in this way was fortuitous.



The three photographs show sets of sub-parallel, sometimes branching, lines resembling structures described in the 1980s by Ben Bland as 'sisal matting', but not subsequently followed up by Ben. On closer examination other structures, both associated and separate, have been identified, including small fronds and 'buds' – tiny onion-like features on the bedding planes.

This fossil assemblage accumulated in shallow water, as shown by bedding structures including shallow ripple marks, and presumably represents the habitat of the living organisms. Also known from this horizon is the larger *Charniodiscus cliffi*, a species characterised by the large, flat, featureless



area within the main outer ring (fig. 4).

These tantalising trace fossils appear to extend the diversity of the Charnian Ediacaran fauna both numerically and in time, but unfortunately it has been difficult to obtain permission to visit the site since; a group from the Russell Society visited in June this year but reported finding no fossiliferous strata.



Fig 4. *Charniodiscus cliffi* from Old Cliffe Hill Quarry - the specimen in Leicester Museum

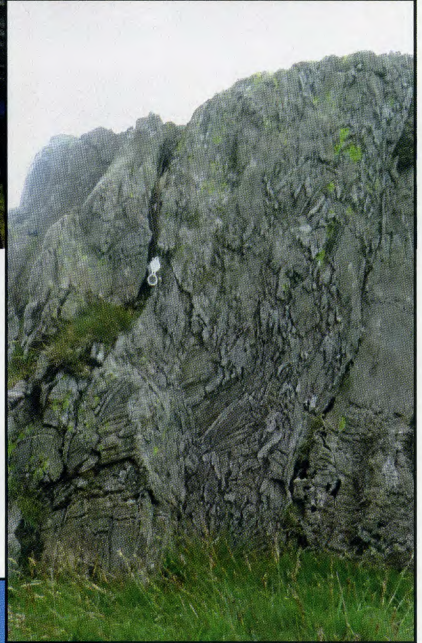
# SUMMER EXCURSIONS

## Lake District weekend



This year's weekend away at Coniston was a damp affair! Dr Simon Drake (Birkbeck) thrives in it apparently! Here he is against a diorite exposure on the Walna Scar Road. ©Padej Kumlertsakul

This exposure on The Bell was seen on the Coniston weekend, 8th to 10th July. Reminiscent of the Slump Breccia in Bradgate Park?  
©Rob Tripp



Members also went to Timley Knott, off the Walna Scar Road, to view the contact of the underlying volcanics (L) with the steeply dipping, and cleaved, limestone - but not on the sunny day this picture was taken!  
©Mike Allen

# SUMMER EXCURSIONS

Creeton Quarry, Lincolnshire



The Section visited Creeton Quarry on the 6th August, supposedly to sample the disconformable Rutland Formation beneath the trees. Members, however did not pass up on the Limestone!

©Rob Tripp



The Jurassic Upper Lincolnshire Limestone Member of Creeton Quarry is mostly grainstone. Here Section Members are pictured on the visit on 6th August.

©Rob Tripp



The blue-hearted Upper Lincolnshire Limestone, in the base of the quarry, holds many wood fossils.

©Rob Tripp

Great Tew Quarry, Oxfordshire

Dennis Gamble stands over the Marlstone Rock ferruginous limestone, on 3rd September, with the Whitby Mudstone over-burden being the dressed slope. ©Alan Eames



## Oxford University Museum

Section C Visitors to the Oxford Museum of Natural History, 9th April. Our Hosts were Dr Monica Price, Head of Earth Collections, and Dr Hilary Ketchum, Collections Manager for Vertebrate Palaeontology.

©Rob Tripp



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## Wreccsam, Clywd

Fossil Forest in the Wreccsam Museum. This diorama is exhibiting the Stigmaria found at Brymbo as well as insects.

©Rob Tripp



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Gathered at the old foundry building at Brymbo on 7th May were Section C and Peter Appleton with his dog. Peter showed the many specimens under curation in the buildings here.

©Rob Tripp



# SUMMER EXCURSIONS

## Bradgate Park



On 3rd July, Lynden Cooper (ULAS) described the archeological dig of the late paleolithic (Creswelian) 'hunting camp' in Bradgate Park to Section C.

©Graham Cheesman



Lynden talked about the art of flint knapping, and showed some of the nationally important finds from the dig.

©Graham Cheesman

The hunting camp excavation site, looking east. Lynden Cooper explaining the location, at the point where the gorge opens onto the 'plain', where deer still congregate to cross the river,  
©Rob Tripp



Geology was also covered during the visit to Bradgate Park on the 3rd July; Dr Mike Howe (BGS) explained the dip-and-cleavage relationship to the Members on the summit of Monument Crags.

© Graham Cheesman

## Presidential Pearls – 1.

# The Pyrenees and Grotte Casteret

T.D. Ford



Brèche de Roland (Hautes-Pyrénées)  
Photo: france-montagnes.com

A recent postcard from Roy Clements, then staying at his daughter's house in the south of France, showed a view of the summit ridge of the Pyrenees and the striking gap of the Brèche de Roland (Hautes-Pyrénées department), in the frontier between France and Spain. Roy did not know that I had been there in 1956 as part of an expedition to visit the Grotte Casteret (Aragon, Spain). The expedition comprised Gordon Warwick, geomorphologist at Birmingham University, Tony

Sutcliffe, anthropologist at the Natural History Museum at South Kensington – and me. The aim was to look at Grotte Casteret's ice-filled cavern as a possible relic of the Pleistocene Ice Age.

We took all our gear in a Morris Traveller via the 'air bridge' from Lympe airport in Kent to Boulogne. The air bridge was a Bristol Freighter plane which carried three cars and twelve passengers. We drove through France visiting the Palaeolithic painted cave of Lascaux (Grotte de Lascaux, Dordogne) en route to the magnificent Cirque de Gavarnie (Hautes-Pyrénées). We hired a mule for the final climb to

the Brèche de Roland, where we camped for a week. The Grotte de Casteret was one kilometre to the south – in Spain. The vast entrance chamber was over 100m long and 50m wide, entirely floored by a sheet of ice, but this was not a Pleistocene glacial relic. Instead it was an accumulation of frozen drip-water about 10m thick – 'decorated' by the droppings of choughs which nested in the roof.

To one side was an ice column about 20m high, but this again was frozen percolation drips which formed each spring and collapsed in the autumn. We each collected our data with the intention of writing it up for a joint paper. I



General view of the entrance to Grotte Casteret  
Photo: TDF



Inside the entrance to Grotte Casteret with the ice lake bearing chough droppings  
 Photo: TDF

did the basic geology (folded Eocene limestones thrust over Palaeozoic metamorphics); the other two never did theirs, so nothing was ever published. Hence this belated note. The Grotte continued right through the hill to a second entrance beyond.

On the return journey, we called at the home of the famous French caver, Norbert Casteret, and he enabled us to visit several Palaeolithic caves: Grotte de Niaux (Ariège), with a frieze of animals around a chamber the size of a large theatre; the Grotte des

Trois Frères (Ariège), with its caricature of a "sorcerer" in its lowest chamber; and the Grotte du Mas-d'Azil (Ariège), with hand-prints, which is also notable for the public road that runs through the cave. We also visited the Grotte de Massabielle in Lourdes (Saint Bernadette's cave); the Rivière Souterraine de Labouiche (Ariège), a vast cave with a boat trip to the exit; and the Grotte des Combarelles (Dordogne), another Palaeolithic site with its engravings of many animals. Our route home continued via the volcanic region of Les Puys in the Massif Central, and the scenic gorges of the Tarn.



The ice column in Grotte Casteret  
 Photo: TDF



The ice column about to collapse  
 Photo: TDF

## ABSTRACTS OF WINTER PROGRAMME TALKS

October 19<sup>th</sup> 2016

### Evolution of Neotropical flora during the Neogene and Quaternary periods

Dr Juan Carlos Berrio

Dept. of Geography, University of Leicester

Tropical mountains are regarded as the most diverse hotspot of the world. In northern South America, tropical Andes has a characteristic altitudinal gradient allowing to have distinctive vegetation patterns and plant diversity which are, to a significant degree, shaped by the altitudinal distribution of climatic conditions. The fossil pollen evidences from the paleo-lake at the High Plain of Bogota and surroundings, reveal and document the evolution of Neotropical flora associated to the development of the Andean mountains.

The environmental history of the northern Andes start back about 34 million to 65 million years ago (Ma), when the tectonic plate diving under the Pacific edge of South America caused a severe uplift changing the shape of northern South America dramatically with an impactful effect on the regional climate. The northern South American lowlands was once part of a much larger "pan-Amazonian" region which, before the late Miocene (until 10 Ma), included the area of the present Amazon, Orinoco, and Magdalena drainage basins. The term pan-Amazonia refers to a vast area containing diverse faunal fossil records that are now restricted to Amazonia.

During the middle-to-late Miocene period, the vegetation established on the "proto"-Andes consisted of tropical lowland forests, with some Gondwanan families as predominant (*Nothofagus*, *Araucaria*, *Gunnera*, and *Winteraceae*). However, the most intense peaks of Andean mountains built during the late middle Miocene (~12 Ma) and early Pliocene (~4.5 Ma). Plate reorganization ultimately resulted in closing of the Panama Isthmus during the Pliocene (at ~3.5 Ma) and led to the Great American Biotic Interchange. During the early Pliocene the number of tropical lowland taxa decreased and the taxa from present-day Andean and Subandean vegetation increased suggesting the first stage in the uplift to approximately 1000±500 m elevation.

In middle Pliocene time, the predominance of Andean and Subandean taxa (*Podocarpus*, *Ilex*, *Hedyosmum* etc.), constituting 50-60% of the regional vegetation, suggests that the Andes reached an altitude of approx. 2000±500 m elevation. Phytogeographically, the composition of the middle Pliocene vegetation was characterised by a predominance of wide tropical and Neotropical taxa. During the late Pliocene the Andes uplifted to approx. 2200±500 m elevation. The wide tropical and Neotropical species showed a considerable decrease, whereas taxa with a wide temperate origin dominated the fossil assemblage. The composition of the late Pliocene Andean forest differed from that of late Quaternary age. The absence of certain taxa such as *Alnus*, *Juglans* and *Quercus* was apparent, which migrated in to South America during Pleistocene times.

The progressive uplift of Andean mountains in northern South America promoted the development of alpine vegetation (the so-called Paramo vegetation and grass Paramo). Today, we can find this typical ecosystem occurring at altitude between 3200 and 4000 m elevation, with characteristic taxa such as *Espeletia* (Asteraceae), *Hypericum*, *Acaena-Polylepis* (as indicators of the upper Forest Line (UFL), Ericaceae (incl. *Vaccinium*) amongst others, and the grass Paramo with Poaceae, Caryophyllaceae and *Aragoa*.

November 2<sup>nd</sup> 2016

### 1769 all over again? Energy resources in the developing world, how we'll never get to a two degree world, and what we should do about it.

Prof Mike Stephenson

British Geological Survey, Keyworth

Before 1700, fossil fuels had already overtaken wood as the leading provider of heat in the homes of British people. Plentiful coal in the north of England enabled the natural supply of non-

fossil energy to be bypassed. So began what has been called, by the historian Andreas Malm, the 'fossil economy' or the burning of carbon that came not from local growing sources (trees) but from wood 330 million years old. Next came the steam engine (1769). Not long after (from 1781), cotton manufacture, previously based near fast-flowing streams, became independent of water when the rotative steam engines of Boulton and Watt led to the growth of large, steam-powered mills concentrated in towns like Manchester and Salford. Steam engines for winding gear and pumps followed, and meant that even more coal could be mined. This start of the fossil economy might also be seen as the start of the latest of the geological epochs – the Anthropocene, marked geochemically by, amongst others, the rise in CO<sub>2</sub>, as recorded in ice cores.

That relationship with coal is weaker in Britain today where most of our electrical power, at least, is today generated by gas. But coal continues to be used elsewhere in the world. Predictions like those of the International Energy Agency (IEA) suggest that coal will continue to be used heavily in the future, and will probably be important for global electricity generation for many years to come. According to the most recent IEA forecast, coal demand will grow to 5814 million tonnes per year through 2020, a rate of 0.8% per year on average. Half of the growth, 149 Mt, will be in India.

With all this coal burning how are we going to get to the 2°C limit set at the 2015 United Nations Climate Change Conference, COP 21, concluded in Paris in December? What technologies can be used? And if we can't get to a 'two degree world' what does science tell us about being able to adapt?

November 16<sup>th</sup> 2016

## **Habitats and environments of the early Carboniferous tetrapod world**

Dr Carys Bennett

Department of Geology, University of Leicester

The TW:eed Project Project (Tetrapod World: early evolution and diversification) examines the rebuilding of terrestrial ecosystems following a major extinction at the end of the Devonian. At this time tetrapods were undergoing a range of innovations to become the first vertebrate animal to walk on land. The project focuses on the Tournaisian Ballagan Formation that was deposited in a coastal to alluvial setting. Study sites include inland and coastal localities from the Scottish Borders region and a 500 metre deep borehole drilled in 2013.

During the last four years the team have found a wealth of tetrapod, fish and invertebrate fossils that disprove the theory that there was a gap in the fossil record (Romer's Gap) after the extinction. Instead, a diverse range of new tetrapod species and other animals became established shortly after the extinction. The fossil record gap is likely due to collections bias and people not knowing where to look. The most common lithology preserving tetrapods is sandy siltstone, deposited in seasonal flooding events as cohesive flows. This facies usually overlies palaeosols and can be difficult to identify in the field. However, it contains the most fossil-rich deposits in the early Carboniferous, including lungfish, ray-finned fish, sharks, bivalves, ostracods, millipedes, scorpions and abundant plant remains. Using sedimentology, geochemistry (carbon isotopes) and micropalaeontology, my research explores what the ancient landscape looked like and how that changed over time. Encompassing river systems, evaporitic lakes, vegetated marshes, dry desiccated plains and monsoonal floods, the landscape was dynamic. Through time the environment was ever-changing and periodically subject to short-lived marine incursions onto the floodplain. This dynamic setting was important in influencing the evolution of tetrapods as they became fully terrestrial. You can find out more about our project and see photos of our recent excavation and museum exhibit here: [www.tetrapods.org](http://www.tetrapods.org).

## Winter Programme, 2016-2017

All held at 7.30pm in Lecture Theatre 3, Ken Edwards Building, on the main University of Leicester campus, except where stated. Refreshments served from 7.00pm.

Details: Acting Chairman Mark Evans, mark.evans@leicester.gov.uk, 0116 454 0231

### 2016

#### **Wednesday October 5<sup>th</sup>**

Dr James Neenan (University of Oxford). **Theme: Placodonts.**

#### **Wednesday October 19<sup>th</sup>**

Dr Juan Carlos Berrio (University of Leicester). **Evolution of Neotropical flora during the Neogene and Quaternary periods.** [Abstract, p.12]

#### **Wednesday November 2<sup>nd</sup>**

Prof Mike Stephenson (British Geological Survey). **1769 all over again? Energy resources in the developing world, how we'll never get to a two degree world, and what we should do about it.** [Abstract, p.12]

#### **Wednesday November 16<sup>th</sup>**

Dr Carys Bennett (University of Leicester). **Habitats and environments of the early Carboniferous tetrapod world.** [Abstract, p.13]

#### **Wednesday November 30<sup>th</sup>**

Dr Xiaoya Ma (Natural History Museum, London). **Theme: early lobopods/arthropods and exceptional preservation.**

#### **Wednesday December 14<sup>th</sup>**

Christmas Meeting, New Walk Museum, Leicester.

### 2017

#### **Monday January 9<sup>th</sup>**

Parent Body Lecture, New Walk Museum, Leicester

Paul Denton (British Geological Survey). **Ground-shaking education: using seismic signals to educate and inspire.**

#### **Wednesday January 18<sup>th</sup>** Note: Lecture Theatre 2, Ken Edwards Building

Dr Alex Liu (University of Cambridge). **Decoding the fossil record of early animal evolution.**

#### **Wednesday February 1<sup>st</sup>**

Dr Gawen Jenkin (University of Leicester). **The mine of the future: Can we make metal extraction from ores "green"?**

#### **Wednesday February 15<sup>th</sup>**

Members' Evening, New Walk Museum, Leicester.

#### **Wednesday March 1<sup>st</sup>**

Dr Erwan Le Ber (University of Leicester). **High impact drilling: Chicxulub and its peak ring.**

#### **Saturday March 11<sup>th</sup>**

Annual Saturday Seminar, University of Leicester.

#### **Geology in Space.**

#### **Wednesday March 15<sup>th</sup>**

TBA.

#### **Wednesday March 29<sup>th</sup>**

Annual General Meeting

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