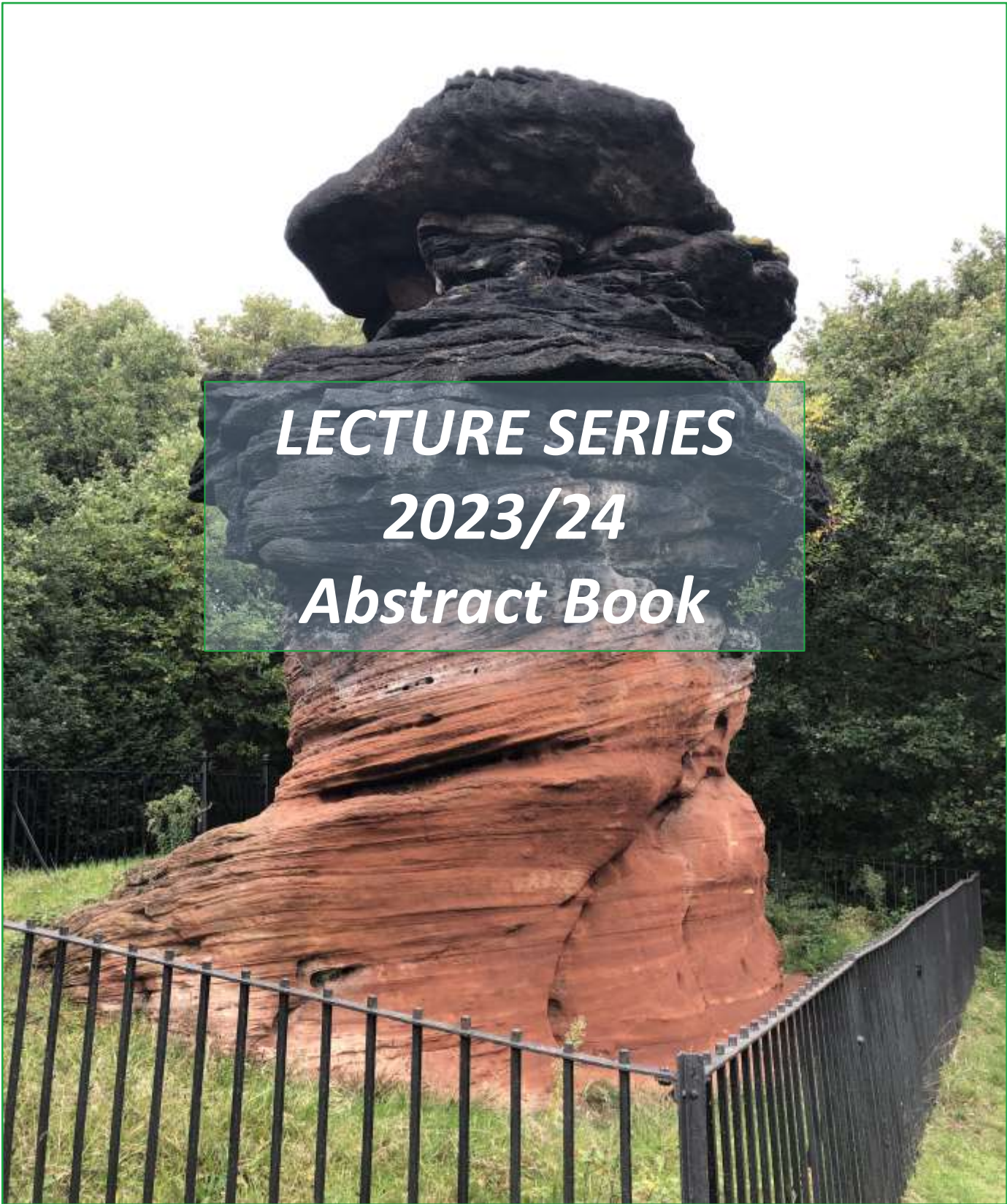




# East Midlands Geological Society



***LECTURE SERIES  
2023/24  
Abstract Book***

# LECTURES AUTUMN 2023 – SPRING 2024

## Saturday 14 October 2023: Professor David Manning

*Mineral solutions to global problems – how minerals can feed the world and remove atmospheric CO<sub>2</sub>*

## Saturday 11 November 2023: Dr Benjamin Chandler

*Extent, style and timing of former glaciation in the Gaick, Scotland*

## Saturday 9 December 2023: Dr Richard Shaw

*The Ecton Copper Mines – a brief history and recent discoveries*

## Saturday 13 January 2024: Dr Jack Matthews

*Celebrating the Origins of Animal Life: Building a UNESCO Global Geopark in Charnwood Forest, UK*

## Saturday 10 February 2024: Dr Tony Waltham

*Diamond Geology*

## Saturday 9 March 2024: Professor Peter Worsley

*Geology of Stonehenge and the Bluestone controversy*

## Saturday 13 April 2024: Paul Hildreth

*The Lower Cretaceous 'East Lindsey Group' – a jewel in the geological crown of Lincolnshire*



East Midlands  
Geological Society  
*Autumn Lectures 2023*



Saturday 14 October 2023, 6.00 - 7.00pm

*Mineral solutions to global problems – how  
minerals can feed the world and remove  
atmospheric CO<sub>2</sub>*

[David Manning](#)

Professor of Soil Science, Newcastle University



[Manning, DAC & Theodoro, SH. 2020](#)

**Venue:** School of Geography, Sir Clive Granger Building,  
University of Nottingham, University Park, Nottingham,  
NG7 2RD [Google Maps](#)

[www.emgs.org.uk/#lectures](http://www.emgs.org.uk/#lectures)

## ABSTRACT

*The global population is projected to rise from 8 billion in 2022 to 10 billion in 2050; Africa's population will double in that period, from 1.3 to 2.5 billion. The challenge of feeding so many people, while doing what we can to mitigate the effects of climate change, is enormous.*

*New approaches are required that go beyond the conventional, and minerals have a vital role to play. From the point of view of food security and crop production, crushed silicate rocks have considerable potential especially in tropical soils, where chemical fertilizers are lost through rainfall and demand a high price. Brazil has pioneered the use of crushed silicate rocks as sources of crop nutrition, with an established and growing internal market that has reduced dependency on imported fertilizers, especially for the small farms that produce food sold in markets for everyday consumption. There is abundant scope for transferring that knowledge to Africa.*

*The natural weathering of silicate rocks to provide crop nutrients also removes CO<sub>2</sub> from the atmosphere. As the rock dissolves through contact with water, cations are released – and need to be counterbalanced with an anion, bicarbonate. This process transfers carbon from the biological to the geological cycle, and so it plays no further part in global warming.*

*The rocks used to achieve these goals are all around us. Looking at some examples, the scientific rationale behind their use in crop rotation and CO<sub>2</sub> removal will be explained. All of us can take advantage of this approach through our own gardens or community gardens and ground near where we live.*



East Midlands  
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Saturday 11 November 2023, 6.00 - 7.00pm

*Extent, style and timing of former glaciation in the  
Gaick, Scotland*

[Dr Benjamin Chandler](#)

School of Geography, University of Nottingham



<https://www.walkhighlands.co.uk/perthshire/gaick-corbetts.shtml>

**Venue:** School of Geography, Sir Clive Granger Building,  
University of Nottingham, University Park, Nottingham,  
NG7 2RD [Google Maps](#)

[www.emgs.org.uk/#lectures](http://www.emgs.org.uk/#lectures)

**ABSTRACT:** *This talk will present the results of recent geomorphological and sedimentological investigations in the Gaick, Central Grampians, Scotland. The Gaick has proven to be an enigmatic and controversial glaciated landscape, which is dominated by a dissected upland plateau.*

*Previous studies of the glacial landforms in this area have resulted in conflicting interpretations that are difficult to reconcile with sequences of events reconstructed elsewhere in the Central Scottish Highlands. Systematic geomorphological mapping and sedimentological analyses, combined with a glacial landsystems approach, have revealed evidence for multiple glaciations:*

- (1) unzipping of local and regional ice masses during deglaciation of the last British Ice Age;*
- (2) extensive pre-Younger Dryas plateau icefield glaciation; and*
- (3) spatially restricted plateau icefield glaciation during the Younger Dryas.*

*This new model of glacial events in the Gaick has important implications for understanding glacial events in the wider region.*



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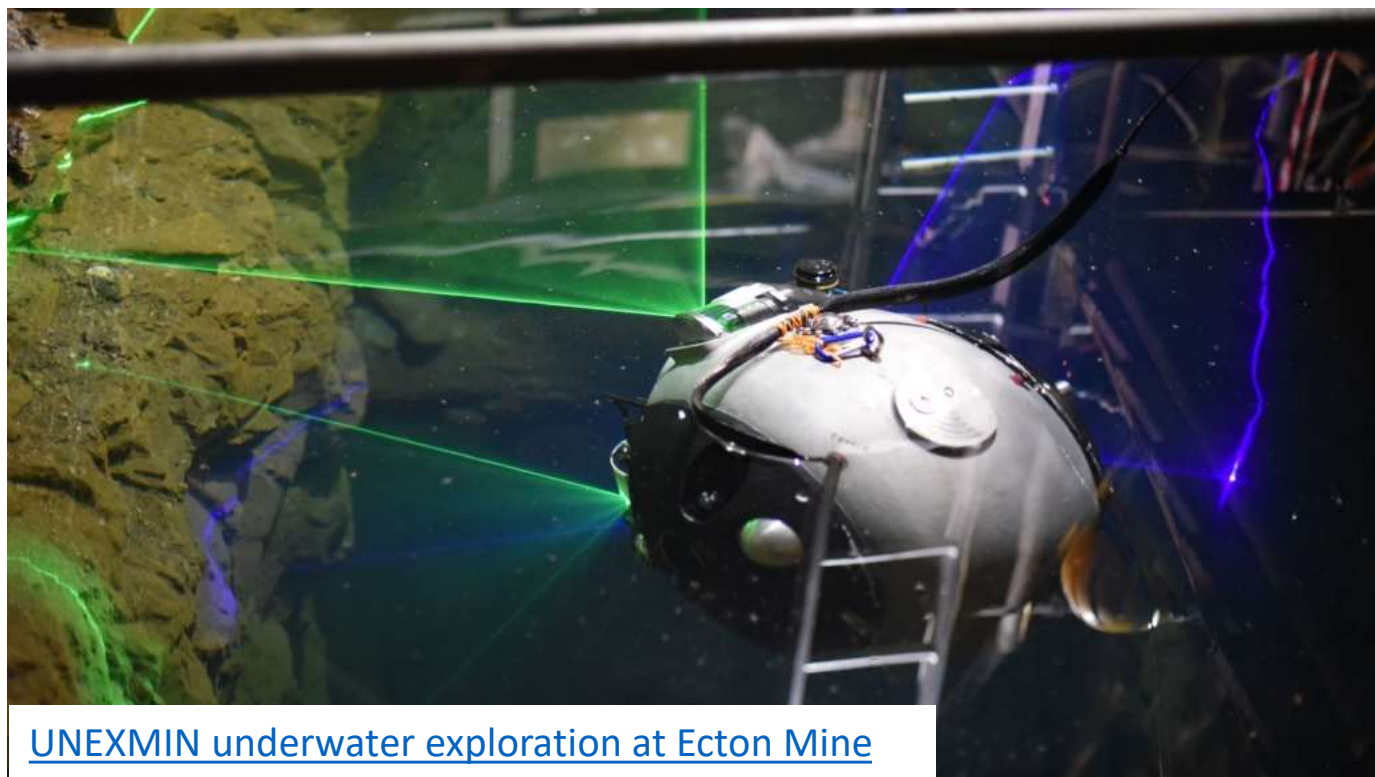


Saturday 9 December 2023, 6.00 - 7.00pm

*The Ecton Copper Mines - a brief history and  
recent discoveries*

**Dr Richard Shaw**

Ecton Mines Education Trust and Peak District Mines  
Historical Society



[UNEXMIN underwater exploration at Ecton Mine](#)

**Venue:** School of Geography, Sir Clive Granger Building,  
University of Nottingham, University Park, Nottingham,  
NG7 2RD [Google Maps](#)

[www.emgs.org.uk](http://www.emgs.org.uk)

**ABSTRACT:** *Ecton Hill was first mined in the Bronze Age about 3500 years ago, for pigment and possibly also copper. Copper working ceased until the mid-17<sup>th</sup> century though there are Medieval lead workings on the hill. In the 1660s, Ecton was the site of the first or second use of gunpowder for blasting in a British mine (the other location is Cromford Sough), though the mine was not a success at that time.*

*Located on land owned by the Chatsworth Estate, the mine was leased out to 'adventurers' in the early 1700's . Following the vein down from the top of the hill, by 1724 they had reached level of the River Manifold and started Deep Ecton Level to drain the workings. About 20m below the level the ore became very rich, and the adventurers renewed their lease in 1731 in order to benefit. The mine was taken 'in house' by the Estate in 1760 and worked to about 300m below river level. In-house mining ceased in 1823 due to decreasing ore values. Through the rest of the 19th century the mine was worked by a number of companies, sometimes in conjunction with the adjacent Clayton Mine, most of which were share scams based on the mine's past wealth. The mine was finally abandoned in 1889.*

*In the 1960s Geoff Cox bought the mine and mineral rights, and the mine was used for a variety of mining-related educational purposes. Following his death, the mine and mineral rights were vested in Ecton Mine Education Trust ([EMET](#)) and the educational-related activities in Ecton Hill Field Studies Association ([EHFSA](#)). EMET have responsibility for ongoing safety and maintenance while EHFSA use the mine for educational activities aimed at older primary school upwards. In 2019 EMET participated as a test site in the EU-funded [UNEXMIN](#) project to develop autonomous underwater vehicles for the exploration of flooded, abandoned mines. This resulted in a series of submersible dives enabling a more thorough understanding of the workings and their geology to be developed. A follow-up project, [UNEXUP](#), also used the site in 2022 to test a redesigned submersible and there have been several other dives in the mine. Despite these explorations much of the mine remains unexplored below water level.*

*The presentation will include a brief history of the mine, a summary of the results of the underwater explorations with a focus on improved geological understanding of the ore deposits and, technology permitting, a short video of the underwater conditions.*





East Midlands Geological Society

60<sup>th</sup> Anniversary 1964-2024

*Spring Lectures 2024*



Saturday 13 January 2024, 6.00 - 7.00pm

*Celebrating the Origins of Animal Life: Building a  
UNESCO Global Geopark in Charnwood Forest, UK*

[Dr Jack Matthews](#)

Geoheritage Conservation and Interpretation Officer,  
Charnwood Forest Geopark



The Old Man of Beacon Hill, Charnwood Forest

**Venue:** School of Geography, Sir Clive Granger Building,  
University of Nottingham, University Park, Nottingham,  
NG7 2RD [Google Maps](#)

[www.emgs.org.uk](http://www.emgs.org.uk)

**ABSTRACT:** *Charnwood Forest in Leicestershire is host to some of the oldest animal fossils in the world, many of which have been key to our understanding of the rise of animals during the Ediacaran period around 570 million years ago. In addition to its internationally significant palaeontology, the area is also home to a number of working and historic quarries whose lithologies have shaped the built environment of the United Kingdom for more than 2000 years. This presentation will outline the internationally significant geodiversity of Charnwood Forest - including the outstanding ancient fossils - and the ways it has shaped the landscape, communities, and people of Britain's 'unexpected upland'.*



**Dr Jack Matthews** is Geoheritage Conservation and Interpretation Officer at the Charnwood Forest Geopark, based out of the National Forest Company. He is an Honorary Researcher at the Oxford University Museum of Natural History, specialising in research questions involving geology and palaeontology. His research examines questions around the first appearance of animals in the geological record,

as well as policy engagement work involving the management of geological heritage.

In 2021 Jack was part of a team that successfully lobbied UNESCO to establish an International Geodiversity Day. This annual celebration will raise the profile of geodiversity, promoting the importance of non-living nature in achieving the UN Sustainable Development Goals, its contribution to society, and the interconnection with biodiversity. He is a Board member of the international environmental charity Earthwatch Europe.

Jack holds a Doctorate and Masters in Earth Sciences from the University of Oxford. He is a former Vice President (Graduates) of the Oxford University Student Union and maintains a keen interest in politics, especially at the interface between science and policy.



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Saturday 10 February 2024, 6.00 - 7.00pm

*Diamond Geology*

[Dr Tony Waltham](#)

President, East Midlands Geological Society



**Venue:** School of Geography, Sir Clive Granger Building,  
University of Nottingham, University Park, Nottingham,  
NG7 2RD [Google Maps](#)

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## **ABSTRACT:**

*In both their geology and their industry, diamonds are like no other mineral. For centuries, the world's supply came almost entirely from the alluvials of Golconda in India. Only in 1870 were kimberlite pipes discovered, and it was a long time after that before their gas-rich explosive origins were really appreciated. The main source of gem-quality stones switched to Kimberley in South Africa, but this has subsequently been displaced by Botswana, Russia and then Canada. Exploration for diamond-bearing pipes continues today, and has involved some exciting stories with both lone prospectors and major companies.*



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Saturday 9 March 2024, 6.00 - 7.00pm

*Geology of Stonehenge and the Bluestone controversy*

**Professor Peter Worsley**

Emeritus Professor of Quaternary Geology,  
University of Reading

*From south-west Wales to Salisbury Plain. How were  
the Bluestones transported*

*from here.....*

*.....to here?*



**Venue:** School of Geography, Sir Clive Granger Building,  
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## **ABSTRACT:**

*Stonehenge has recently come into the public eye due to the publication of the results of new geochemical work. The Sun newspaper declared 'Mystery of where the giant rocks came from SOLVED' whereas The Guardian was more cautious with a headline 'Archaeologists discover likely source of Stonehenge's giant sarsen stones'. The senior English Heritage properties historian said that she was delighted that one of the most intriguing questions about Stonehenge had been answered. The background to this euphoria will be critically examined and the geological fundamentals reviewed.*

*Apart from the sarsens, the other geological problem lies with the assemblage of 'foreign' rocks incorporated into the henge structure, i.e. the so-called Bluestones. There now appears to be little doubt that the Bluestones are primarily derived from outcrops in south-west Wales but the mechanism whereby they arrived to Salisbury Plain is far from being resolved. Most archaeologists have accepted the hypothesis that Neolithic people were responsible for the transport of the Bluestones from their source to the plain but over time the favoured routes have changed drastically. In contrast geologists have been split between those who accept the human transport mode and those who favour natural earth surface processes as being responsible for transportation – i.e. glaciation. The strengths and weaknesses of these competing ideas will be discussed.*



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Saturday 13 April 2024, 6.00 - 7.00pm

*The Lower Cretaceous 'East Lindsey Group' – a jewel in the geological crown of Lincolnshire*

[Paul Hildreth](#)

General Secretary and Past President, Yorkshire Geological Society



**Venue:** School of Geography, Sir Clive Granger Building,  
University of Nottingham, University Park, Nottingham,  
NG7 2RD [Google Maps](#)

[www.emgs.org.uk](http://www.emgs.org.uk)

**ABSTRACT:** *The county of Lincolnshire is often overlooked as a venue for geology field trips and even research but it possesses several opportunities for examining significant and interesting exposures. The Elsham Sandstone is a unique, local deposit within the Kimmeridge Clay Formation and at Welton-le-Wold neighbouring sites offer exposures of three glacial tills and an interglacial gravel deposit.*

*The county's jewel in the crown however is the under-published Lower Cretaceous sequence coeval, at least in part, with the very well-known Wealden Group of south east England and the enigmatic Speeton Clay of Filey Bay. This 'East Lindsey Group' is unique to Lincolnshire. It thins northwards to feather out north of Caistor and experiences facies changes in the area beneath The Wash which pass into an East Midlands suite transitional with those of the south of England.*

*The impact of the 'East Lindsey Group' is threefold. It has influenced the shape of the western edge of the Lincolnshire Wolds producing an attractive fringing landscape between the broad Upper Jurassic (Oxfordian - Kimmeridgian) clay vale and the Chalk scarp. It has supplied three locally-important and distinctive building stones that can be recognised in the villages and towns of East Lindsey. It has provided the raw material, ironstone, for a relatively short-lived but locally important mining industry, the scars of which are still visible in the hillsides and valleys of the Claxby and Nettleton area.*

*The various lithologies and palaeontology of the rocks comprising the 'East Lindsey Group' allow for a reconstruction of the palaeogeography of the Lincolnshire area during early Cretaceous times (145 – 113 million years ago) and its relationship with other parts of the present day United Kingdom.*