



EDINBURGH GEOLOGICAL SOCIETY

Promoting public interest in geology and the advancement of geological knowledge

Autumn Newsletter 2017

Welcome to the Society's 184th session! The Newsletter is now playing an important role in communicating with the membership. It provides an opportunity to keep everyone up to date, not only with the lectures and excursions but also other Earth science related events that may be of interest. The lecture programme for 2017-18 is wide ranging with talks which will engage both amateur and professional alike. I hope they will further stimulate your interest in geology.

Stuart Monro, EGS President, president@edinburghgeolsoc.org



DATES FOR YOUR DIARY 2017

1-31 October Scotland's Geoheritage Festival

- 1 October
Building stones of Dalkeith
- 6-8 October
Earthcache Weekend
- 7 October
Volcano Fun Day, Holyrood
- 10 October
**Midlothian Fossils,
Loanhead Library**
- 14 October
**Best Places project launch,
Dynamic Earth**

Public Lecture: Scotland's recent fossil finds

In the last few years, very exciting new fossil finds have been made in several locations in Scotland, unlocking the secrets of key moments in evolution. In Skye and the Inner Hebrides, new reptile and mammal finds from the middle Jurassic add important knowledge about this time period which is sparsely represented elsewhere. In the Scottish Borders, new tetrapod fossils help fill

'Romer's Gap' and demonstrate the migration of vertebrate life onto land and the evolution of our first five-fingered ancestors. And the pavements of Edinburgh and other urban areas are providing new Devonian fish fossils and furthering our understanding of life in Devonian lakes.

This public lecture gives the opportunity to hear first-hand about major advances in our understanding of Scotland's geology and the evolution of life. Chaired by Mark Stephen from BBC Radio Scotland, the panel will include Nick Fraser (National Museums Scotland) and Steve Brusatte, Elsa Panciroli and Tom Challands (all from the University of Edinburgh).
Venue: Appleton Tower, 11 Crichton Street, Edinburgh, EH8 9LE.

Wednesday 1 November, 7pm

Tickets £5, free for students and under 18s. Book online at edinburghgeolsoc.org/public-lecture



Sauropod footprint, Skye. Photo: Steve Brusatte

11 October
**Lecture: Dr Phil Wilby,
BGS Keyworth**

25 October
Lecture: Dr Chris Duffin

1 November, 7pm
**Public Lecture: Scotland's
recent fossil finds**

8 November
**Lecture: Dr Aubrey Lea
Zerkle, Univ St Andrews**

22 November
**Lecture: Prof Jenny Clack,
Univ Cambridge**

6 December
Fellows' Night

2018

10 January
**Lecture: Asher Haynes,
Sirius Minerals**

24 January
**Lecture: Dr Jonathan
Cloutier, Univ St Andrews**

7 February
**AGM (7pm) & Lecture:
Hannah Watkins, Univ
Aberdeen**

21 February
**Clough Medal Lecture: Prof
Bob Holdsworth**

7 March
**Lecture: Prof Lorna Dawson,
James Hutton Institute**

21 March
**Lecture: Dr Brian Baptie,
BGS Scotland**

Explore the world's geology with Earthcaching

Full details at edinburghgeolsoc.org/excursions/earthcache-weekend-october-2017/

An Earthcache is a specific location where you can learn about local geology. This is similar to Geocaching but doesn't involve a physical cache: instead you visit a specific location and observe the geology. If you want to 'claim' the cache, there are questions to answer. With the growing availability of smart phones, it is easy to take part – all you need is a free Geocaching app. There are Earthcaches across the world, providing opportunities to explore geology wherever you are.

Scotland has hundreds of Earthcaches – you can find them on geocaching.com. Prepared by individual enthusiasts, they

The Edinburgh U3A Geology Group explore a local Earthcache

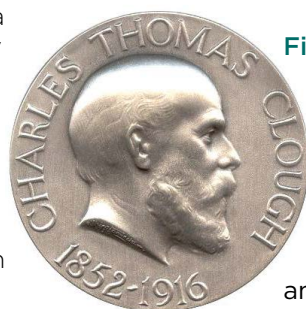
give a good introduction to many of our important geological sites, at varying levels of detail. EGS is organising an Earthcache Weekend on 6-8 October, with a programme that includes an introductory meeting, an open day in Holyrood Park and a coach trip to East Lothian and the Borders. Join in to find out more about Earthcaching – we're expecting visitors from across Europe!



Society Medal and Awards

The Society recognises excellence in geology by making two prestigious awards, the Clough Medal and the Clough Memorial Award, and supports geological fieldwork with small grants from the Clough and Mykura Funds.

The Clough Medal is presented annually to a geologist whose original work has materially increased the knowledge of the geology of Scotland and/or the north of England, or who is Scottish by birth or by adoption and residence and has significantly advanced the knowledge of any aspect of geology. This year's recipient is Prof Bob Holdsworth, in recognition of his exceptional contribution to research in structural geology and, in particular, in establishing the tectonic framework of the Moine rocks of Sutherland, together with many other notable achievements.



The Clough Memorial Award is a monetary award, given to a geologist of British nationality and normally under 35 years old whose research on some aspect of the geology of Scotland or the north of England is considered as having outstanding merit. It is awarded biennially, and is due to be awarded in 2018-2019.

Fieldwork Grants from the Clough and Mykura Funds are normally of the order of a few hundred pounds, and support geological field work at home or abroad. This year grants were given to Bob Gooday and Gautier Nicoli.

Nominations for the Clough Medal and Clough Memorial Award for 2018-19 and applications for fieldwork grants from the Clough and Mykura Funds are invited by 31 January 2018. Full details are on our website at edinburghgeolsoc.org/home/grants-and-awards/.

Long Excursion to Cornwall 12-19 May 2018



The 2017 Long Excursion at Duntulm, Trotternish on the Isle of Skye. *Photo: Anne Burgess*

Professor Emeritus Peter Scott of the Camborne School of Mines, University of Exeter, and Dr Mike Styles of the British Geological Survey have kindly agreed to lead the Society's Long Excursion to Cornwall in 2018. The excursion will take place from 12 to 19 May 2018, to fit in with the tides.

Anyone interested in participating is requested to contact Anne Burgess, preferably by e-mail, Please do not attempt to make an actual booking at this stage; bookings will be opened in early October.

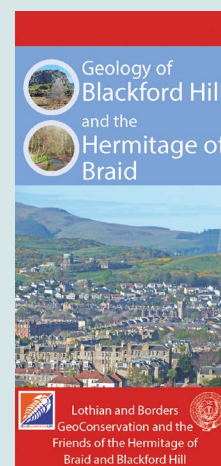
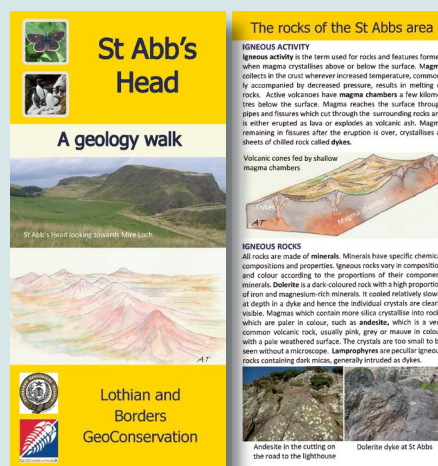
Anne Burgess, Long Excursion Organiser
longexcursion@edinburghgeolsoc.org

Recent public engagement activities

One of the key aims of EGS is to promote public understanding of geology, and to this end we often organise events for the general public and support the work of Scotland's Geoparks and geoconservation groups. Recently Lothian and Borders GeoConservation have been particularly active in preparing a series of popular leaflets. Over 20 of these have been published for sites in and around Edinburgh. They are available as free pdf downloads from our website, and volunteers from the group have distributed printed copies at fairs and events. This year, new leaflets have been prepared for St Abbs, Blackford Hill and the Hopetoun Shore. <http://www.edinburghgeolsoc.org/publications/geoconservation-leaflets/>

We organised trips to Siccar Point as part of the Edinburgh International Science Festival in April and ran a stall and four guided walks for the St Abbs

Science Day in August. We are contributing several events to Scotland's Geoheritage Festival in October. Grants have been given in support of a summer Field Camp organised by Geobus at the University of St Andrews.



Evening Lecture Programme 2017-2018

Our varied programme of illustrated lectures runs from October to Easter, on Wednesday evenings at 7.30 pm. These meetings are open to the public, there is no charge, and visitors are most welcome. Tea and biscuits are served afterwards, providing an informal opportunity to chat to other members, and ask advice from local experts. The lectures take place in the Hutton Lecture Theatre in the Grant Institute, The King's Buildings, James Hutton Road, Edinburgh EH9 3FE.

Further information about most lectures, including more detailed abstracts, is available at edinburghgeolsoc.org/lectures/ or contact Graham Leslie, Lectures Secretary agle@bgs.ac.uk

2017

Wednesday 11 October, 7.30pm

Dr Phil Wilby, BGS Keyworth

Palaeontology of the Oxford Clay

Phil Wilby led a team who re-excavated a famous fossil site in the Oxford Clay near Chippenham, first discovered during railway construction in the 1840s and the source of important Jurassic fish and cephalopods.

Details of this talk were not available when the newsletter went to press but further information will be posted on the EGS website in advance.

Wednesday 25 October, 7.30pm

Dr Chris Duffin, Retired

Richard Owen and Fossil Vertebrates

Cadaverous in appearance and irascible in nature, Richard Owen (1804-1892) was the self-styled 'British Cuvier'. It was he who introduced the term 'dinosaur', described hordes of fossil reptiles, the earliest mammals, and intimated the existence of giant antipodean fossil birds from a single bone fragment. A great rival of Darwin, he was at the forefront of palaeontological research for decades and both honoured and revered at home and abroad. It was he who oversaw the establishment of the Natural History Museum at South Kensington, and the model dinosaurs now in Sydenham Park.

Wednesday 8 November, 7.30pm

Dr Aubrey Lea Zerkle, Univ St Andrews

Biological Regulation of Planetary Atmospheres: Insights from the Early Earth

The chemistry of the Earth's surface has undergone dramatic changes since simple single-celled organisms evolved in the oceans more than 3 billion years ago. We now seek to understand how the evolution of life has responded to, and in some cases driven, these changes. Biology certainly contributed to the Great Oxidation Event (GOE): an event that produced the habitable biosphere we inhabit today.

Aubrey Lea Zerkle is a biogeochemist with a primary interest in the early Earth and extraterrestrial environments.

Wednesday 22 November, 7.30pm

Prof Jenny Clack, Univ Cambridge

Scotland: the world's greatest place for vertebrate palaeontology?

Scotland has probably the world's richest record of Carboniferous tetrapods, yielding the majority of those globally rare early Carboniferous forms. Recently, it has provided an array of tetrapods from the Tournaisian stage known for its paucity of such fossils, informally called 'Romer's Gap'. In the Ballagan Formation of the Scottish Borders, our TW:eed project has discovered that no such gap exists. Rather, this was the time when tetrapods first began to diversify on land, and founded the base of the modern tetrapod fauna.

Jenny Clack is Emeritus Professor of Vertebrate Palaeontology at Cambridge and a lead researcher in the TW:eed Project.



Life in a Carboniferous lake. Reconstruction by Mark Witton ©NMS

Wednesday 6 December, 7.30pm

Fellows' Night

This meeting, close to the anniversary of the foundation of the Society, is a chance to meet other members informally, with a series of short talks given by members, followed by refreshments. The event will be held in the upper level of the Lyell Centre, Heriot Watt campus (Research Ave S, Edinburgh EH14 4AP) and booking is not required. We are very grateful to BGS Scotland for hosting this event. If you would like to give a short talk on a subject of interest to members, please contact Chris Lofthouse (fellowsnight@edinburghgeolsoc.org).

2018

Wednesday 10 January, 7.30pm

Asher Haynes, Sirius Minerals

Sirius Minerals and Polyhalite – the Future of Fertilizer

Sirius Minerals plc is a FTSE listed company focussed on the development of its polyhalite mining project in North Yorkshire. Our minerals area contains the world's largest known high-grade polyhalite resource, which is sold as a multi-nutrient fertilizer. A new mine located 3.5km south of Whitby in North Yorkshire will extract the polyhalite ore, and a 37 km underground transport system will convey the ore to a granulation facility on Teesside, with a new export quay on the River Tees. Construction is already underway and once in operation the project will employ over 1000 people.

Wednesday 24 January, 7.30pm

MIS/EGS Joint Lecture: Dr Jonathan Cloutier, Univ St Andrews

The use of short-wave infrared hyperspectral reflectance in mineral exploration

Hyperspectral reflectance spectroscopy has the ability to identify mineralogical changes associated with hydrothermal ore deposits. It is a rapid and relatively

inexpensive technique that can collect high density data in real time in the field, making this technique ideal for mineral exploration. Examples from volcanogenic massive sulphide, orogenic gold and unconformity-related uranium deposits demonstrate what the visible and infrared spectrum tell us about mineralisation processes. *Jonathan Cloutier is a lecturer in Economic Geology at the University of St Andrews.*

Wednesday 7 February, AGM 7pm, Lecture 7.30pm

Hannah Watkins, Univ Aberdeen

Predicting strain and fracture patterns in a fold-thrust belt, NW Scotland

Progressive deformation occurs in fold-thrust belts as thrusts propagate and folds amplify. An understanding of how strain, in particular fractures, is distributed through these belts is important for understanding fractured hydrocarbon reservoirs. The Achnashellach Culmination in the Moine Thrust Belt, NW Scotland, is used as an outcrop analogue to a fractured reservoir, comparing modelling results with field data to determine how predictable strain is and the main controls on fracture distribution.

Hannah Watkins was awarded the Society's Clough Memorial Award in 2016-17.

Wednesday 21 February, 7.30pm

Clough Medal Lecture joint lecture with the Geological Society of Glasgow: Prof Bob Holdsworth, Univ Durham
Cracked and full of sand: insights into the development of fractured basement reservoirs west of Shetland

The fractured Precambrian gneisses of the Rona Ridge on the SE margin of the Faroe-Shetland Basin contain at least two substantial oil fields (Clair and Lancaster). Mineralization and oil charge occurred over a period of 20-30 million years in the late Cretaceous. The oil is hosted in meshes of interconnected fractures formed during a single protracted, episode of brittle deformation.

The fractures are partially filled with clastic sedimentary material. We will review the significance of these findings for fractured basement reservoirs elsewhere. *Bob Holdsworth is the founder and leader of the Reactivation Research Group (RRG) in Durham.*

Wednesday 7 March, 7.30pm

Prof Lorna Dawson, James Hutton Institute

FSoil in criminal investigations: investigation and evaluation in current and cold cases

Forensic soil science is an increasingly important discipline, using soils, minerals, dusts, plants and rock fragments to determine provenance on items such as clothing, footwear and vehicles to provide a chronology of their ownership, custody or location. Soil materials have been used as forensic trace evidence for many years, and are often highly distinctive from one region to another. Samples of less than 10 milligrams can now be accurately characterised, which permits forensic soil science to also contribute to cold case investigations, both in providing intelligence and evidence in court. Case studies will show where soil can play a pivotal role.

Lorna Dawson is Head of Forensic Soil Science at The James Hutton Institute in Aberdeen.

Wednesday 21 March, 7.30pm

Dr Brian Baptie, BGS Scotland

Is earthquake activity increasing?

Destructive earthquakes often lead to speculation that earthquake activity is increasing. But is there really any hard evidence to support this? I will draw on earthquake statistics and geophysics to discuss this question with examples of how earthquake activity rates can change.

Brian Baptie is head of the Earthquake Seismology team at BGS in Edinburgh, and is often to be heard in the media in response to major earthquakes world-wide.

Council News

Neil Mackenzie has volunteered to take up the role of Secretary from Andrew Rushworth. Grateful thanks to Andrew for volunteering to hold the reins until a new Secretary was found. Neil was formerly a Secretary of the Solent Regional Group of Geological Society of London between 2016 and 2017; and brings a hydrogeological background onto the committee.

New committee members are always needed for the Society. If you think you could offer even a small amount of voluntary time, such as helping with members' mailings, we would welcome hearing from you. Please contact the Honorary Secretary.

EGS News email list

Join the EGS News email list to be kept informed of changes to programmes and other news of interest to members. Please contact the Membership Secretary.

Society contacts

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The Edinburgh Geological Society is a friendly and informal organisation with a wide range of members of varied backgrounds and interests, united in an interest in rocks and the science of the Earth. This newsletter is published in September and March, with details of our lectures and excursions programme. Members will also receive the Annual Report and AGM details in January.