



THE HIGHLAND GEOLOGICAL SOCIETY
Scottish Charity No. SC004427

September 2022

Dear members,

Welcome to the HGS autumn newsletter in which we detail our planned activities for the winter lecture season and include brief outlines of proposed field trips during 2023.

We hope you've all had a pleasant summer with plenty of geologically inclined walks or field trips and we've compiled a few sentences about the HGS field trips we've held in the spring and summer of 2022 to give you all a flavour of what the HGS gets up to in the great outdoors. This is an opportune moment to say a big thank you to our field trip organisers, leaders and to our HGS membership who have turned out to support our endeavours in 2022.

May: Exploration of the Ullapool Thrust - A joint field trip led by Alan Thompson (HGS) and Pete Harrison (NW Highlands Geopark).

This was a sequel to the virtual field trip delivered by Alan to HGS in September 2021. There was a good turnout of members and others and it proved to be a very enjoyable and informative day in the course of which we examined various exposures associated with the small culmination in the Moine Thrust Zone just to the north of Ullapool, and in particular the exposures of the Ullapool Thrust in the local limestone quarry and at Craig nam Broc.

June: Shetland.

This was another of our self-led residential weeks, and proved to be just as enjoyable as its predecessors. Nine of us stayed at the Vaxter House hostel while four others stayed variously in their motorhome or a local hotel. In the course of a busy week we managed to visit more or less all the principal localities of geological interest on the mainland of Shetland and on the northern isles of Fetlar and Unst. We were fortunate that Allen Fraser, who over the years has led many excursions in those parts, was able to spend a day with us at Eshaness and in addition he had previously given us permission to reproduce the excellent field guide which he had prepared for the Edinburgh Geological Society's excursion to Shetland some years ago, a copy of which we found in the papers of our late President, Sinclair Ross. In addition we had the benefit of a detailed guide prepared by Andy Moffat based on his recce to Shetland in the summer of 2021.

July: Stack of Glencoul.

A large party had congregated at Kylesku, all keenly anticipating a boat trip up Loch Glencoul and then a day walking and examining thrust sheets around the Stack of Glencoul. Unfortunately, heavy rain and low mist made the excursion untenable and instead the group reassembled at Clachtoll and the remainder of the day was spent looking at the Torridonian sandstone at the Split Rock and the Lewisian 'Big Splat' exposure. The weather here was very different, pleasant sunshine was experienced during the afternoon and the group's previous disappointment soon forgotten.

August: Fife.

Dr Katie Strang led a three day trip looking at Carboniferous geology starting at Charlestown in the far west of Fife, sediments around Burntisland and finishing the weekend at St Monans. A very varied range of geology was experienced, ranging from looking at extensive limestone workings to examining stromatolites and collecting Carboniferous fossil fish coprolites

September: Hopeman, Buckie.

Dave Longstaff, HGS, led this joint HGS/AGS field trip on the Saturday looking at the Hopeman sandstones and the different depositional environments they display, quarries, old and current, and Permian fossil footprints.

On the Sunday Don Stewart, AGS, led a trip looking at the mapping of the ORS/Dalradian unconformity and related features including enigmatic stromatolite beds at Buckpool.



Carboniferous sediments, Burntisland, Fife



Deformed sandstone, Hopeman



HGS at Clachtoll, Lewisian gneiss



HGS Shetland group, Skaw beach, Unst

Forthcoming events: Autumn/Winter lectures 2022

The lectures in October, November, February and March will be delivered on Wednesday evenings at 7.30 pm using Zoom, and Alan Thompson will send out the usual Zoom joining details shortly before each lecture. It is intended to arrange a live meeting for David Jarman's lecture on Wednesday 7th December and for Noel Williams' lecture on Wednesday 18th January. The arrangements for these two lectures are still to be completed, and further details will follow.

2022/2023 lecture summary:

Wed 5th Oct: Dr Jenny Bennet, Dr Eileen Hendriks, Palaeozoic stratigraphy.

Wed 16th Nov: Cindy Howells, Dinosaurs and deserts in Wales.

Wed 7th Dec: David Jarman, The shaping of the Scottish mountains by rock slope failures, with case studies from the NW Highlands. In person.

2023

Wed 18th Jan: Noel Williams, Lochaber Geopark: Big Boulders of Scotland. In person.

Wed 8th Feb: HGS AGM followed by Peter Reynolds, Making thin sections.

Wed 15th March: Prof Rob Strachan, Metamorphic and igneous geology of Sutherland.

Details of lectures

Wed 5th October, Dr Jenny Bennett PhD FGS FHEA, Vice Chair of the Geology Section, Devonshire Association, and Past Chair of the Ussher Society: *Eileen Mary Lind Hendriks (1887–1978), the meticulous researcher who resolved the Palaeozoic stratigraphy and structure of South-West England.*

Hendriks was born in Birmingham, the only child of a prosperous middle-class family. Following the early death of her father she studied geology at Aberystwyth before moving to Belfast, with her widowed mother, as senior demonstrator in the Geology Department. She resigned after a year and subsequently tried unsuccessfully to obtain a permanent post as a geologist, including attempting to join the Geological Survey. Mapping first in mid-Wales and then in southwest England she became an accomplished field geologist, gaining a PhD from Imperial College, London in 1932. Finding fragments of fossil wood in apparently barren sediments, she demonstrated their Devonian age and recognised the presence of thrusting, introducing Ordovician and Silurian rocks into the sequence. Moving permanently to Cornwall in 1938/9, and seeking help from specialists throughout the world, she devoted the rest of her long life to geology, without any institutional support. In spite of this, she received awards from the Geological Society and the Royal Geological Society of Cornwall. Living in a cottage on the Lizard with her Alsatian dogs, she became respected as the energetic doyenne of Cornish geology by the young researchers who flocked to the south-west from 1955 onwards.



Photo: Hendriks at the Ussher Society meeting in St Austell 1965

Wed 16th November, Cindy Howells, Curator: Palaeontology, Department of Natural Sciences, National Museum of Wales: *Dinosaurs and Deserts in South Wales*

This talk will take us back in time to the late Triassic and early Jurassic, when dinosaurs were newly evolved. We'll be looking at the environments that existed in south Wales and the varied dinosaur finds here that have added such a lot to our knowledge of these times.

Wed 7th December, David Jarman, HGS: *The shaping of the Scottish mountains by rock slope failures, with case studies from the NW Highlands.*

Rock slope failure - RSF - spans rock avalanches, rockslides, and rock slope deformations. In the Highlands today, these are very rare (in bedrock as against superficial deposits) and very small-scale (as at the recent Quoich dam road closure). Yet they have occurred very widely and

extensively (reaching 3 sq km), during and after deglaciations. The relict Highland population of over 900 significant RSFs (Jarman and Harrison, *Geomorphology*, 2019) is scarcely known and little researched, yet has left conspicuous marks on many mountains. RSF occurs primarily in the schists (as the main mountain rock type) but also in Torridonian sandstone - notably Beinn Alligin - gneiss, and even granite. It seems to associate with locales of concentrated erosion in bedrock, such as glacial breaches and trough-heads, rather than on main glen walls. In the NW Highlands, a major cluster occurs in Cluanie-Affric-Kintail. Key sites including Beinn Fhada and Sgurr na Ciste Duibhe will be presented, followed by a lightning tour of numerous examples to give an overall impression of the phenomenon.

Wed 18th January, Noel Williams, Founding member of Lochaber Geopark and author of "Exploring the Landscape of Ben Nevis and Glen Nevis: A walker's guide to the rocks and landscape of Ben Nevis and Glen Nevis": *Big Boulders in Scotland*

This talk will examine the extraordinary work carried out in the nineteenth century (1872–1884) by the Boulder Committee for the Royal Society of Edinburgh. Numerous people, including several learned figures of the day (such as the famous mineralogist Professor Forster Heddle), walked long distances to record all the large boulders found across the length and breadth of the country. Their findings were summarised in ten Boulder Reports published in the Proceedings of the RSoE. The talk will pay particular attention to the boulders found on the hills in the Lochaber district around Fort William.

Wed 8th February, Peter Reynolds, HGS: *Making Thin Sections.*

Geologists often talk of 'examining in thin section' when they want to identify a rock, but what is a thin section, and how do we get them?

In geology a 'thin section' is a slice of rock, ground down to a thickness of 30 microns, and mounted on a glass slide so that it can be examined under a petrological microscope. They can be made by a machine, perhaps in a university laboratory, in which case they can be difficult to access, or commercially, in which case they can be expensive. Alternatively, you can make your own in your own home.

The Society's late President, Sinclair Ross, was an expert maker of thin sections, producing several thousand which are now in the Hunterian Museum in Glasgow. He taught Ann and Peter Reynolds his technique, and in this talk Peter will describe Sinclair's methods and show some examples.

The plan for the evening is to hold the Society's AGM on Zoom at 6.45 pm, to be followed by Peter's talk at 7.30 pm

Wed 15th March, Prof Rob Strachan, University of Portsmouth. *Metamorphic and igneous geology of Sutherland: implications for regional-scale plate tectonic models for the Caledonian orogeny.*

I shall take us on a traverse from the Moine Thrust, which marks the western margin of the Scottish Caledonides, eastwards across Moine rocks which get higher in metamorphic grade the further we travel until we reach the Old Red Sandstone sedimentary rocks of the Orcadian Basin. This traverse includes inliers of Lewisian-type basement and the calc-alkaline meta-igneous rocks of the Strathy Complex. Important questions to be considered include: 1) do the basement inliers correlate with the Lewisian rocks west of the Moine Thrust or are they a completely different accreted terrane? 2) does the Strathy Complex hide an oceanic suture? 3) how do we explain the complex Caledonian metamorphic history of the Moine rocks - all one continuous event or separate events? 4) how and why do the voluminous Caledonian "Newer Granites" form?

HGS Excursions 2023

Next spring and summer might seem many months away but we're already making tentative plans for next year's field trips. If any HGS members have suggestions for the location for field trips, or ideas for specific geological topics for study in the field please let a member of the committee know, we are very open to new ideas.

Sat 22nd – 29th April 2023, HGS self-led field trip to Berwickshire coast.

Anne Cockroft writes: After Alison Tymon's talk about the Berwickshire coast we know there is plenty of geology to see on the Berwickshire coast. For further information about the geology see Alison's website

<http://berwickshirerocks.org.uk/index.html>

The walks leaflets detail short and accessible walks, designed for her U3A group to visit during lockdown.

The plan is to have a self-led field trip, along the same lines as our recent Shetland trip and previous visits to Eigg, Mull and so on.

I have booked and HGS has paid a deposit on a self-catering house in Eyemouth for the week:

<https://www.sykescottages.co.uk/cottage/Northumbria-Northumberland-Eyemouth/Harbour-Retreat-1055601.html#duration=7&calendar=2023-04&changeover=6>

It has 2 double and 3 twin rooms, one double is en-suite, and two further bathrooms. It has wifi and a dishwasher, but is otherwise fairly basic. It costs £809 for the week, to be shared between those staying. We expect to designate one or two people to cook for the group each evening and to cater separately for other meals.

The tides are favourable for this week: at Eyemouth, low tide is 11.17 on the 23rd moving to 15.50 on the 28th. Many of the coastal localities require or would benefit from low tide, so we may include some inland localities as well.

If you wish to come on the trip, or are thinking about coming and would like to be kept informed, please let me know at hgssec@gmail.com – it's helpful to have indications of interest without commitment at this stage.

If you definitely wish to share a room in the house I will look at numbers of males and females before confirming. Otherwise it's first come first served, and a £50 deposit to HGS secures the place.

Sat 23rd- 25th September 2023. Durness. Dr Iain Allison.

Iain has led us before and has kindly agreed to lead us again next Autumn. The location is his choice, and details will be circulated nearer the time. At this stage he says: "We'll have one day in the Balnakiel-Durness-Rispond area and the other on the east side of Loch Eriboll", plus we have options for the Monday.

We know from experience that accommodation can be very difficult in this area due to severe staff shortages, and we have decided to book well in advance and to centre ourselves at the Smoo Caves Hotel. Accommodation has been booked for Iain at the hotel (arr Fri 22 Sept 2023, dep Mon 25 Sept 2023). We plan to eat together in the evenings at the hotel. Alternative accommodation is available in B&Bs, the local Youth Hostel, the Lazy Crofter Bunkhouse, and of course using campervans.

Contact Alan Thompson if you have any questions or suggestions for this weekend.

Work in progress: Other locations and events under consideration for 2023 are day trips to the Tarbatness peninsula, the geology between Burghead and Hopeman which includes the Burghead fault, and the area around Gairloch. But these are only suggestions and will need following up in more detail.

Very recently Andy Moffat contacted Gavin Berkenheger about the possibility of a talk and/or field trip looking at the critical mineral potential in north-east Scotland especially the Huntley/Knock intrusion.

Book review

The Dunedin Academic has sent us a review copy of *The Lewisian*, and here is David Rae's review. The list price of the book on the Dunedin website is £38. Those who purchase a copy on this website can claim a discount of 15%. The book will be added to the HGS collection at the central library in Inverness, and so may be borrowed by members with a Highland Council library ticket and a membership card endorsed with the word "Library".

The Lewisian: Britain's Oldest Rocks.

Author: Graham Park Publisher: Dunedin Academic Press

ISBN 978-1-78046-098-7

This book documents how our understanding of the geological history of the Lewisian has developed over the last 200 years. The author has been involved with research on the Lewisian for 60 years including organising major conferences on the topic. In his preface he states: "My aim in this book was to review the progression of ideas on this fascinating group of rocks since they first captured the attention of geologists in the early nineteenth century".

After an introduction describing the extent of the Lewisian both onshore and offshore the book is divided into three parts.

The first part (40 pages) covers the work from MacCulloch in 1819 through to that of Sutton and Watson in 1951 on the Mainland and Dearnley and Dunning in 1968 on the Outer Hebrides. Of particular note is the coverage of the work of the 19th century researchers through to the 1907 Memoir by Peach and Horne et. al. which makes available material that is often not readily accessible and includes frequent maps and drawings from these works.

The second part (120 pages) covers research work in both areas up to the present day and the third (105 pages) considers structural and petrogenic models and presents a tectonic overview. There is an extensive list of references, a comprehensive glossary, over 150 figures and plates – many in colour, plus tables of chemical analyses and geochronological data.

According to its back cover the book "will appeal to many geologists including students, geological visitors to the Northwest of Scotland and academics seeking a readable account of remarkable and significant advances in earth science". I would suggest that parts two and three of the book would only be of benefit to a certain subset of these groups. The text makes frequent mention of deformation phases D1 etc, foliation S fabrics S1 etc, fold types F1 etc. Other terminology includes LD1, LD2 etc and LM1 and LM2. Petrological terms include agmatization, basites and TTG gneiss. The glossary provides a brief explanation of all these terms, but readers will need a detailed understanding of structural geology and petrology unless they are prepared to make frequent reference to the glossary and to develop their understanding of these terms.

Also, while the narrative to many, but not all, of the photographs of outcrops gives the latitude and longitude (expressed in degrees) of the outcrop in question, there is no comprehensive list of localities with OS grid references. So this is not a book that one can readily use when planning a day or weekend trip to examine particular formations or structures in a discrete area such as Gairloch or Assynt (and in fairness to the author it should be said that he evidently did not set out to write such a book).

Thus, although the documenting and synthesis of 200 years of research is undoubtedly a considerable achievement, this is not a book that many members of the Society are likely to want to buy. For those interested in the early history of the research borrowing the book to read the first part would be worthwhile. Buyers of the book will most probably be undergraduate/graduates (or their institutions) looking to undertake work on the Lewisian and academics already working on the Lewisian or similar rocks who wish to extend their area of interest. This book will provide them with an excellent basis for their work plus many references to access additional detail.

David Rae

Items of interest, geological websites

NEW! 5th edition of 'Geology of Scotland'.

Most members will have seen the bible of Scottish geology 'The Geology of Scotland', the last edition being published in 2002.

It is expected the 5th edition will be published in March 2023 which will contain the latest thinking on Scotland's geology and will be eagerly anticipated by academic and amateur geologists alike.

Some of the Edinburgh Geological Society's lectures next year will feature talks by some of the authors on selected chapters in the new edition.

<https://www.edinburghgeolsoc.org/lectures/>

Professor Rob Butler, University of Aberdeen, has been very busy putting together a highly impressive series of over 180 instructional geology videos, many from Scottish locations, onto YouTube. These videos generally last around 15 minutes and are highly recommended - a tremendously informative resource.

<https://www.youtube.com/channel/UCIUyjr1yPCZQWYI9cJCO1mA/videos>

Paleogeographic maps. An interesting website which might be new to some members is Dinosaurpictures which allows viewers to select a location and find its position on paleogeographic maps from any geological period they wish. Very informative and good fun!

<https://dinosaurpictures.org/ancient-earth#240>

Scottish Geology Festival 2023

The committee are exploring ways that the HGS could support the festival next year, one possibility is a pebble day in the vicinity of Rosemarkie, any additional suggestions are welcome.

Geologists Association: Geology from your sofa

<https://geologistsassociation.org.uk/sofageology/>

Palaeocast podcasts:-

<https://www.palaeocast.com/category/mesozoic/>

The Scottish Geology Trust

<http://www.scottishgeologytrust.org/>

Other Scottish geological societies websites

Aberdeen Geological Society

<http://www.aberdeengeolsoc.org.uk/>

Edinburgh Geological Society

<https://www.edinburghgeolsoc.org/>

Glasgow Geological Society

<https://geologyglasgow.org.uk/>

Open University Geology Society

<https://ougs.org/>

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