



# THE HIGHLAND GEOLOGICAL SOCIETY

Scottish Charity No. SC004427

## OCTOBER 2023 NEWSLETTER

### HGS field trips

HGS organises excursions for members to see interesting geology in the field, sometimes with a leader who knows the geology and other times self-led, using excursion guides and other information about the geology. This newsletter gives more details about our proposed field trips for 2024, followed by accounts of our 2023 field trips.

We would like to encourage even more members to participate in our field trips. We promote car sharing where possible, both to minimise travel costs and to facilitate easier car parking at our chosen localities. For multi-day excursions, we try to arrange shared accommodation such as a bunkhouse, rental house or Youth Hostel, which also helps to keep costs low and provides a nice focal point for planning and eating as a group. In this case, we need you to let us know well in advance so that we can book for the right number of people. Alternatively you may choose to arrange your own accommodation and join us each day.

### Important: accommodation booking

**Urgent:** If you wish to stay in the Tongue Hostel (June, below) please contact Ann Reynolds at [highlandgeologicalsociety@gmail.com](mailto:highlandgeologicalsociety@gmail.com) **as soon as possible - by 31st October** - if you have not done so already.

Slightly less urgent: If you are interested in the Girvan week (April below) please contact Anne Cockcroft at [hgssec@gmail.com](mailto:hgssec@gmail.com) by **Sunday 5th November** so that we can progress booking the accommodation.

### Proposed field trips for 2024

**Self-led week in Girvan area, Saturday 13th to Saturday 20th April 2024.** These dates have the most favourable tide times for the coastal localities around Girvan and Ballantrae in the Glasgow and Girvan guide. The highlight is the Ballantrae ophiolite complex. We plan to stay at the Brunston Castle resort near Girvan. This has holiday lodges for 4 or 6 people and we could book 2 or 3 as necessary.

**Don Stewart: Glen Tilt, Sunday 19th May.** In 2023 Don led a trip for the Aberdeen G S looking at the rock exposures that influenced James Hutton's thoughts on the age of granitic rocks that he found intruded into the country rock in Glen Tilt. Ann was present on this trip and thought it would interest our members and Don has agreed to provide the same field trip for HGS. We are currently in touch with Atholl Estates to arrange access for cars to the glen.

**Tongue Thursday 20th - Monday 24th June.** **Prof Rob Strachan** has offered to lead us on a 4 day excursion to the North of Scotland. The programme is as follows: Thurs 20 June 2024: Meet at Tongue Hostel where we will be based. Friday 21 June - Moine Thrust Zone at Eriboll Saturday 22 June - Moine/Lewisianoid/ORS rocks around Tongue. Sunday 23 June - ditto around Bettyhill/Torrisdale Bay. Monday 24 June - Moine rocks /Strathy Complex/ORS around Kilmory/Strathy/Portskerra (at which point folk would presumably disperse southwards or stay on the north coast if desired). We are currently arranging accommodation at

the hostel or campsite for participants. Please have a look at the website <https://www.tonguehostelandholidaypark.co.uk>

**Prof Peter Scott: Cromarty and Nigg, Saturday 31st August 1.30 to 7 pm.** We will cross on the Nigg ferry to examine the Old Red Sandstone on the north shore, and return by 4 pm to view the ORS/Moine unconformity and the fish beds on the south shore.

**Prof John Parnell: Scardroy, September/October.** A short visit, with only a short walk, to look at an inlier of the Lewisian Complex, unusually by examining boulders at the bottom of a hillside stream at the head of Strath Conon.

## **HGS field trips 2023**

Many thanks to Dave Longstaff for writing the text and providing most of the photos.

### **Berwickshire Coastline: Saturday 22<sup>nd</sup>- Saturday 29<sup>th</sup> April**

The first excursion was a self-led excursion to the Berwickshire coastline, 22<sup>nd</sup>-29<sup>th</sup> April, with most of the group staying in self-catering accommodation.



**Cocklawburn Beach: rain!**



**Pettico Wick, north of St Abbs Head: sun!**



**Cocklawburn: Eelwell limestone anticline.**



**Grooved limestone: Cheswick beach.**



It's very difficult picking highlights of a week-long excursion but the Berwickshire Coast displays a remarkable variety of, mostly, sedimentary geology. The sandstone beds and plant fossils at Scremerston are well known and with good reason: spectacular geology. Less well known but truly enigmatic are the exposures of the grooved limestones at Cheswick Beach. Alison Tyman, who greatly assisted our week, has studied these rocks and the outcrop certainly invites discussion but we'll probably never know the exact mechanisms at work producing these features.



**Ripple and X-beds: Scremerston sandstone.**



**Ascending the slope from Siccar Point.**



**Old Red Sandstone, Pease Bay.**



**Concretionary sandstone: Cheswick Black Rocks.**

We took the opportunity to visit some iconic locations. We went to Burnmouth, the site of fossil finds of Carboniferous tetrapods (we didn't find any) and, of course, to Siccar Point, a location that every geologist HAS to visit! It is a steep descent down to the Siccar Point outcrop and we were grateful for Peter's rope expertise to ensure our safe descent. The rope proved a valuable aid to our ascent of the slope as well. (Some of the party viewed from the top of the steep slope.)

### **Stac of Glencoul: Saturday 13<sup>th</sup> May**

A group of 12 HGS members met at the Kylesku Hotel on a dry, though cloudy, Saturday morning. This excursion had been cancelled at the last minute last year due to heavy rain so we had more than a touch of anticipation as we prepared to board the ferry that had been generously provided by the Reay Forest Estate. The landing craft took our group to the head of Loch Glencoul where we disembarked and began



the climb up to the Stac of Glencoul. Our intention was to explore parts of the Moine Thrust which is exposed on the flanks of the Stac. One particular target was to find deformed pipe rock, Cambrian Quartzite, which has been sheared by the thrusting.



**Stac of Glencoul seen from the ferry.**



**HGS group disembarking from the landing craft.**



**The lucky (?) few getting a lift on the estate argocat.**



**Deformed Cambrian Quartzite pipe rock.**



**Examining Moine Thrust on west side of the Stac.**



**Moine Schist above quartzite above fucoid beds.**



The group enjoyed active discussions about the geology and the deformation structures that the shearing had been responsible for. We had been traversing steep slopes all day but there were no mishaps and a foot-weary group found their way back to our rendezvous point for the return journey. A highly successful day had been enjoyed by all.

### **Burghead to Hopeman traverse: Sunday 11<sup>th</sup> June.**

This traverse of coastal exposures of Triassic fluvial sandstones and Permian aeolian sandstones displays, in a short distance of 2-3 miles, a remarkable variety of features. A group of 11 members met at Burghead Harbour where we examined clean exposures of the Burghead Beds, a fluvial sandstone deposited by northeastward flowing rivers and showing a variety of sedimentological features created in a constantly changing environment: pebble beds followed by silty bands, often cross-cut by small channels. Just to the east is located the Lossiemouth Fault where the Triassic beds have been laid on top of the Permian Hopeman Sandstones. A splay fault associated with the main fault has allowed a spectacular network of deformation bands to cut through the sandstones. These bands are of interest to oil geologists as they dramatically affect the reservoir capacity of sandstone beds and near Burghead these can be easily studied as onshore analogies of offshore deposits.



**Burghead Beds, Triassic fluvial sandstone.**



**The Lossiemouth Fault splay offshoot.**



**HGS group: Burghead.**



**Deformation bands in Hopeman Sandstone.**

A short distance from the deformation bands we explored the caves in the Cummington cliffs. The roof of the largest cave displays 3 or 4 in situ Permian reptile, or stem-mammal, trackways. Stem-mammals were animals on the evolutionary path between reptiles and mammals. In situ trackways are rarely seen and



give vital context about the dunes in which the tracks were formed. Quarried blocks with tracks have lost all of this context and provenance so these in situ trackways are of some importance.



**In-situ Permian stem-mammal trackway.**



**Carbonate concretionary sandstone.**

Nearer Hopeman we encountered an enigmatic exposure of carbonate cemented concretionary sandstone about which very little has been written. And finally, the most important stop of the day: Hopeman ice cream shop!

### **Kerry Road sulphide mineralisation deposit: Friday 21<sup>st</sup> July**

This was a short 'unofficial' HGS excursion by courtesy of Gavin Berkenheger who is working for Galantas Gold Corporation. He kindly volunteered to show a group of us the current explorations at the Kerry Road sulphide mineralisation deposit.



**Mineralised exposure: roadcut on A832.**



**Drilling rig.**





**Drilled core sample full of sulphides.**



**Banded ironstone formation exposure.**

The Kerry Road copper-zinc-gold deposit is contained in Pre-Cambrian mixed volcanic-sedimentary rocks associated with banded iron formations. A cutting near the drilling rig allowed us to collect hand-sized BIF samples. Although BGS surveys had noted these deposits in the 1990s and there had been previous borehole explorations the Galantas drilling is the first serious attempt to find out the extent and possible commercial value of this area. So, quite a short field trip but we were given a very interesting insight into the world of mineral exploration and thanks to Gavin for giving up his time to our benefit.

### **Durness: Saturday 23<sup>rd</sup>-Monday 25<sup>th</sup> September**

An excellent field trip, noteworthy not only for the superb geology, but also for the fact that the weekend stayed dry, despite dire forecasts!

A party of 10 plus leader (member Iain Allison) and friend assembled on Saturday morning at the car park by the golf club at Balnakeil. A walk west along the cliff top brought us to the small tidal island of Eilean Dubh. The rest of the morning was spent wandering slowly back along the cliffs visiting some of the dolostones of the Durness group. We were able to view the contacts and admire some spectacular stromatolite mounds with cherts formed between them. Other highlights included gutter casts, millet seed quartz sand, 'Leopard rock' and even an 'egg carton formation'.



**Stromatolites and chert: Sail Mhor Dolostone.**



**Gutter casts in the Eilean Dubh Dolostone.**



After lunch we set out to walk to Faraid head. This is a downfaulted Moine outlier. We walked north along the sand visiting firstly an outcrop of moine mylonites and then – after another fine beach – an outcrop of gneissic mylonites. The final stretch to Faraid head crossed an area of ‘oystershell rock’ (chlorite-muscovite-phyllosilicate). We were joined here by a prospective new member in the form of a very friendly red deer hind who accompanied us to the headland. We later learned that she had been rescued by a local farmer and raised with his tups. She now thought of herself as a sheep.

Reaching Faraid Head we turned round – and there was the Moine thrust outlined in the cliff just to our south.

On Sunday we assembled at Sango Sands for a quick visit to another Moine Thrust exposure in the cliff below the campsite, before moving swiftly on to the beach at Traigh na h-Uamhag, where the Lewisian – Cambrian unconformity is exposed in the form of a spectacular sea cave. We also made the acquaintance of agalmatolite – a soft green rock which is associated with the unconformity over a large area.

We now headed for the highlight of the day – the classic exposure of the Arnaboll Thrust, first described by Lapworth in the 1880’s. This was a rough moorland trek taking in Quartzarenites, Fucooid beds, Salterella Grit and finally the Thrust itself with Lewisian Gneiss overlying Pipe Rock. We actually visited two exposures – the classic one and another one perched on a narrow ledge half way up a vertical cliff.



**Moine thrust exposure: Sango sands.**



**Cliff side exposure of the Arnaboll thrust.**





**Arnaboll thrust: classic exposure.**

**Stromatolite, algal mats replaced by chert**

The final stop of the day was the shore of Loch Eriboll at Kempie where we examined the classic sequence of Quartzarenite/ Furoid bed/ Salterella Grit (with real Salterella!) and the Grudaidh dolostone.

### **Rosemarkie Pebble Day in support of Scottish Geology Festival: Saturday 7<sup>th</sup> October**

The final HGS field activity of 2023 was a 'Rosemarkie Pebble Day' in support of the Scottish Geology Trust Festival. A small group of us assembled at Rosemarkie Café on a miserable day of constant heavy rain and, thankfully, we had a few interested guests turn up with whom we could discuss their pebble finds and generally talk about geology. The ranger, Marcia Rae, had brought along shells and sea mammal skulls to add to the discussions. A lot of effort had gone into arranging this event and so it was a shame the weather proved very unhelpful on the day! We now have everything in place to run another pebble day next year – perhaps with better weather.



**Final 'field trip': Rosemarkie Café on a very wet day.**

This has been a fairly brief resume of HGS activities for 2023, I hope you agree we've provided a nice variety of field trip localities to suit all tastes and here's to a successful 2024.