



# THE GEOLOGICAL SOCIETY OF GLASGOW

Registered Scottish Charity No. SC007013

**President: Dr. Neil Clark**

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

**December 2021**

**164/2**



Beinn Alligin - a mountain sculpted by successive glacial and interglacial events. The lecture by Colin Ballantyne on 9th December has been postponed until April but come then to hear how he interprets these iconic landscapes.

## **In this newsletter:**

- Lecture details for December, January and February 2021
- AGM Information
- Residential Excursions 2022
- Dalmellington Fossils

## **Lecture Programme**

### **2021-22 (Session 164)**

#### **Important Information about the Lecture programme**

This session continues to be different. The current status of the Covid-19 pandemic is allowing us to hold some lectures in-person but we may still hold some of our lectures entirely on-line. The programme is organised for the next few months, but is subject to change.

The style and joining instructions will be noted against each lecture. If it is being held online using Zoom, then invitations will be emailed to members a few days prior to the meeting. We hope to record in-person lectures and live-stream them using Zoom

As usual the lectures will commence at 7.30 pm. Lectures will last about an hour plus there will be time afterwards for questions and a vote of thanks.

If you have access to an email address but have not given it to the Society and wish to participate in the zoom lectures please contact [meetings@gsocg.org](mailto:meetings@gsocg.org)

The speakers may grant permission for the lecture to be recorded. If we succeed with the technology then the recording will be posted on Youtube and a link emailed to members.

If the lecture is to be held in-person then there is a new location for these - in the Boyd Orr Building of the University. Signposting will be in place to direct you.

We are limited to a total attendance of 50 at these in-person talks. The lecture room is large so there will be plenty of room for social distancing.

If you want to attend there are three things you must do:

1. Email [meetings@gsocg.org](mailto:meetings@gsocg.org) to reserve a place.
2. Do a Lateral Flow Test that day. Only come if negative!
3. Wear a mask whilst in the building.

#### **Thursday 9<sup>th</sup> December 2021**

**By Zoom Only - TO BE PRECEDED BY THE AGM**

***Dr Neil Clark Hunterian Museum***

#### **“The Hunterian and the Geological Society of Glasgow ”**

The Hunterian at the University of Glasgow have long been closely associated with the Geological Society of Glasgow. It is important that we celebrate the early historical links and recognise that it has not always been smooth. From the early keepers of the Hunterian such as Henry Darwin Rogers who refused to even join the Geological Society of Glasgow, to his successor John Young (the bad), Ethel Currie and Ian Rolfe who all became president of the Society, the Hunterian has always had an influence on the Society. Where will the future of the Society take us post pandemic and is there a future for geology at the Hunterian and Glasgow?

*Dr Neil Clark studied Geology at Edinburgh University where he became a part-time*

research assistant travelling around southern Scotland looking for rare Carboniferous fossil crustaceans. At the same time, he began working as a part-time assistant curator at The Hunterian before starting his PhD in 1985. He completed his PhD on the world-famous Carboniferous Bearsden arthropod fauna in 1989 before working in interactive science centres in Edinburgh, Halifax and Glasgow. In 1990, he began working as part of a team of geological curators at The Hunterian as a result of the Earth Science Review process that amalgamated several university geology departmental collections in Scotland with The Hunterian.



In 1989, Neil began a public engagement exercise to promote geology in Scotland by instituting a national geology week. This soon evolved into a major undertaking with hundreds of events being organised across Scotland during the month of September until 2011.

Much of his early work at The Hunterian was dinosaur related beginning with the discovery of a four toed track from the Jurassic of northern England in 1990, and he was described by the Glasgow Herald as “worth his weight in sand”. Since then he has been working on dinosaur eggs from China as well as Scotland’s first dinosaurs. From 1996 to the present day, there have been new discoveries of Scottish dinosaurs, nearly every year, all from the Isle of Skye. In 2006 he appeared in the book of Guinness World Records with his discovery of the World’s smallest dinosaur footprint. He has now published several dinosaur books for Dorling Kindersely and Readers Digest, as well as having worked on several encyclopedia and a book on Baltic amber. He works on all aspects of Scotland’s fossil heritage and because of his work on Scottish Jurassic dinosaurs was nicknamed Jurassic Clark by the Times Educational Supplement.

**Thursday 13<sup>th</sup> January 2022**

**By Zoom Only**

**Dr Emrys Phillips** British Geological Survey, Edinburgh.

**“Deformed Dirt: the deformation caused by glaciers and ice sheets”**

High resolution seismic data from the Dogger Bank in the central southern North Sea has revealed that the Dogger Bank Formation records a complex history of sedimentation and penecontemporaneous, large-scale, ice-marginal to proglacial glacitectonic deformation. The internal structure of the Dogger Bank thrust-moraine complexes can be directly related to ice sheet dynamics, recording the former positions of a highly dynamic, oscillating Weichselian ice sheet margin as it retreated northwards at the end of the Last Glacial Maximum.

*Emrys graduated in 1984 from Manchester University and undertook an MSc there on high T/P metamorphism in the Lewisian. Subsequently he did a PhD at Cardiff on the*

Monian rocks of Anglesey and then joined BGS in 1990. He is currently Co-leader of Theme 1: Landscape Form, Use and Change: a Dynamic Earth, Scottish Alliance for Geoscience, Environment and Society (SAGES). He has been an Editor of the *Scottish Journal of Geology* and is a past-President of the Westmorland Geological Society.

Further Reading:

PHILLIPS, E. *et al.* 2018. Large-scale glacitectonic deformation in response to active ice sheet retreat across Dogger Bank (southern central North Sea) during the Last Glacial Maximum. *Quaternary Science Reviews*, **179**, 24-47.



**Thursday 10<sup>th</sup> February 2022 In-person at the Boyd Orr**

***Dr. Andrew Findlayson, British Geological Survey, Edinburgh.***

**“Below the bonnie banks – investigating Loch Lomond’s subaqueous Quaternary landscape”**

Andrew’s talk will focus on new work from Loch Lomond and some of the stories coming from the multibeam bathymetric and shallow seismic surveys.

*Andrew graduated in 2001 from the University of St. Andrews in 2001 and undertook an MSc. at Royal Holloway, University of London. Subsequently he did a PhD at the University of Edinburgh and joined BGS in 2005.*

Further Reading:

FINLAYSON, A., FABEL, D., BRADWELL, T. & SUGDEN, D. 2014. Growth and decay of a marine terminating sector of the last British Irish Ice Sheet. *Quaternary Science Reviews* **83**, 28-45.  
FINLAYSON, A (2020): Glacial conditioning and paraglacial sediment reworking in Glen Croe (the Rest and be Thankful), western Scotland. *Proceedings of the Geologists’ Association*, **131**, 138–154.



Future Lectures

**Thursday 10<sup>th</sup> March 2022**

Noel Williams “Big Boulders of Scotland”.

**Thursday April 14th 2022**

Colin Ballantyne, University of St. Andrews. “Landslides, Glaciation and the evolution of mountain landscapes during the Quaternary” (postponed from December)

**Thursday May 14th 2022**

Members’ night

## AGM

### December 9th 2021

The AGM of the society will be held immediately prior to the lecture on Thursday 9th December. Annual reports from Council officers and proposals for Council officers have been distributed to members in the Proceedings Booklet prior to the meeting. This newsletter contains the Agenda and Previous Minutes.

#### Joining the Council

The Society is always looking for members to join the Council - as ordinary members - so if you are interested please contact any Council member. In particular you might want to think whether you have some skills or experience to help out with the various small working groups setup to discuss various important aspects of its governance and future. There is a website group, and new groups dealing with publications, the constitution and outreach/publicity.

If you are interested please contact any Council member

### **Agenda**

1. Welcome
2. Apologies
3. Approval of Minutes of the Annual General Meeting of Session 163 held on Thursday 10th December 2019 and any Matters Arising.
4. Approval of Accounts for the year ended 30th September 2021.
5. Venue and arrangements for Lectures
6. Reports from Council Officers (see Proceedings)
7. Nominations and Election of Office Bearers (see Proceedings)
9. AOCB

### **Minutes of the Annual General Meeting of Session 163 held on Thursday 10th December 2020 by Video Conference**

#### 1. WELCOME

44 Members attended following a lecture by Dr Daniel Field. The President welcomed all present.

#### 2. MINUTES

The minutes of the AGM of Session 162 which was held on 12th December 2019 had been distributed with the newsletter. These were approved by the meeting on the motion of Ian Veitch and Bill Gray.

#### 3. ACCOUNTS FOR THE YEAR ENDED 30TH SEPTEMBER 2020.

The Treasurer presented these Accounts with Notes. They had been independently examined by Ian Anderson. The Accounts were approved unanimously.

#### 4. REPORTS

The President referred to the reports of the various office bearers, copies of which had been sent out to members in the newsletter prior to the AGM.

The reports were as follows: -

The President's report  
Meeting Secretary's report  
Day Excursions report  
Residential Excursion report  
Librarian's report  
Treasurer's report  
Strathclyde Geoconservation Group  
Scottish Journal of Geology Editors' report  
Website report  
Membership Secretary's report

The President spoke to his Report and thanked all Council Officers for the hard work and effort which they had carried out during the COVID-19 restricted Session. He particularly thanked David Webster for his work as Meetings Secretary in producing online field trips and events as well as the Newsletter and Proceedings. Bill Gray referred to the new version of the Aberfoyle Guide by Mike Keen which was now available on the website and in hard copy. The future would remain mainly online meantime. Online events had encouraged attendance at events. Tonight's lecture had been attended by more than 150, considerably more than we would otherwise have expected. The consequences of this would need to be carefully considered by the Council.

#### 5. PROFESSOR DONALD BOWES

Campbell Forrest proposed the election of Professor Donald Bowes as an Honorary Member. Donald Ralph Bowes, born in Australia in 1926, is Emeritus professor of Geology in the University of Glasgow. He read for his first degree in Australia, after which he went to Imperial College, London for his PhD research on the Lewisian Gneiss Complex of NW Scotland, supervised by Sutton and Watson. Most of his academic career was spent in the University of Glasgow, where he was awarded a personal chair in geology. As well as playing an active role in the GSG, he was involved in the establishment of the Scottish Journal of Geology in the 1960s. He was elected as a fellow of the Royal Society of Edinburgh in 1976. Don retired in 1991 but has continued to add to his long list of publications on a wide range of topics in igneous and metamorphic petrology, mineralogy and isotope geochemistry. As well as a paper in Volume 1 of the SJG, he contributed a paper to Volume 50 - a remarkable achievement.

This was seconded by Walter Semple and carried unanimously by the meeting.

#### 6. NOMINATIONS AND ELECTION OF OFFICE BEARERS

The list of officers coming up for election with nominees, proposers and seconders had appeared in the newsletter and on the screen.

Positions were then agreed to unanimously as follows –

Position	Nominee	Proposed by	Seconded by
Vice President	Simon Cuthbert	Mina Cummings	David Webster
Membership Secretary	Campbell Forrest	Roy Bryce	Ian Veitch
Day Excursion Sec	Roy Bryce	Bill Gray	Neil Clark
Residential Excursion Sec	Maggie Donnelly	Neil Clark	Campbell Forrest
Ordinary Member	Gary Hoare	Mina Cummings	Neil Clark
Ordinary Member	Anna Milligan	Ian Veitch	Roy Bryce
Junior Representative	Matthew Staitis	Neil Clark	David Webster
Editor of SJG	Colin Braithwaite*	Brian Bell	Mina Cummings
Independent Examiner	Brian O'Neill	Ian Veitch	Walter Semple

The Council will co-opt Ian Millar as Assistant Meetings Secretary with the intention that he should take over as Meetings Secretary next year.

## 7. OTHER BUSINESS

Maggie Donnelly referred to the recent start of operations at the Cononish Gold mine. She asked if the Society could learn more about the latest developments. There being no other business, the President closed the meeting.

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## Residential Excursions

### Residential Trip to Ardnamurchan

Leader Con Gillen

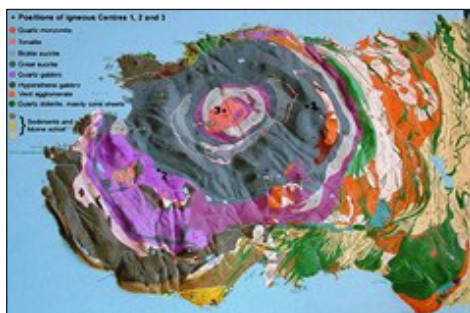
Fri 13th to Mon 16th May 2022.

These dates are later than usual for our spring weekend because we require low tides.

NB this trip was first advertised for April/May 2020. Priority will be given to those members who had expressed interest.

The Ardnamurchan Peninsula, which includes the most westerly point of the Scottish mainland, is composed mainly of the remains of an early Palaeogene volcano with three centres of activity. Part of the North Atlantic Igneous Province which includes Mull, Rum and Skye, it was erupted into Moine metasedimentary rocks and overlain by a sequence of thin sedimentary rocks. Ardnamurchan displays classic geology on a colossal scale,

with features such as mixed magma, ash flows, ring dykes, cone sheets and examples of 'airfall' rocks formed from lava ejected from the heart of the volcano – it is regarded





as almost a ‘textbook volcano’. A drive across the peninsula is a journey through its magma chamber. Its overall structure is difficult to perceive on the ground but from space the picture is much clearer – rings of once molten magma can be seen to define a series of almost perfect circles. These are the lower parts of the volcano after the superstructure has been planed off by erosion, in this case, effectively, by the last Ice Age. We plan to visit significant localities of igneous, sedimentary and metamorphic rocks and there may also be the opportunity to sail to Tobermory (whales!) for those who wish to do less climbing!!

Accommodation will be B & B in Kilchoan etc; transport will be in shared cars.

There are still places available on this trip so if you are interested, please contact the Residential Excursions Secretary, Maggie Donnelly asap, at [restrips@gsocg.org](mailto:restrips@gsocg.org) because accommodation is not plentiful and gets booked up quickly.

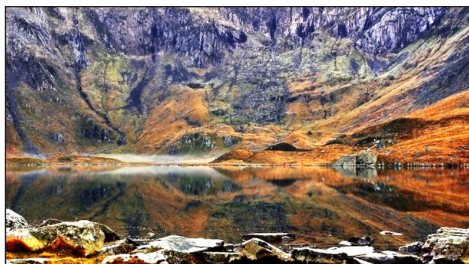
## **Residential Trip to Snowdonia**

Leader Simon Cuthbert

Fri 9th to Mon 12th Sept 2022.

The Landscape of Snowdonia National Park, “Parc Cenedlaethol Eryri” in Welsh (Eryri means place of the eagles) is dramatic and varied, with mountains, high passes, craggy peaks and precipices and cascading waterfalls. The elegant pyramid of Snowdon – Yr Wyddfa – is the highest peak at 3,560ft. Snowdonia’s geology consists of sedimentary, volcanic and intrusive rocks of late Proterozoic to Silurian age. The rugged mountain scenery is dominated by the Ordovician volcanics, including spectacular pyroclastic rocks, all related to subduction of the Iapetus Ocean crust. The geochemistry of the igneous rocks suggest that they formed as part of the back arc basin in a volcanic arc system. These, and the famous Cambrian slates that “roofed the world” were intensely faulted, folded and subjected to low-grade metamorphism during the Caledonian Orogeny. The region was uplifted as the North Atlantic opened during the Cenozoic while the current mountainous landscape and its cwms (corries) have resulted from repeated late Cenozoic glaciations, as recognised by Charles Darwin during his travels in the area.

The trip will focus on the Ordovician volcanics in which we can see evidence for giant ash-flow eruptions in the extensive ignimbrites. We will also examine the large-scale Caledonian folding, all set in Eryri’s wonderful glacier-carved mountain scenery. We may also manage a trip on the Snowdonia mountain railway!



Accommodation will be B & B; transport to be decided. If you are interested, please contact the Residential Excursions Secretary, Maggie Donnelly at [restrips@gsocg.org](mailto:restrips@gsocg.org).



## News and Topical Articles

### Dalmellington Fossils by Gary Hoare

If you happen to drive through the village of Dalmellington in East Ayrshire, you cannot help but notice an enormous spoil heap on the far left of the village (see photo). This is on the B741 road to New Cumnock. On a closer inspection this tip contains various rocks from the Scottish coal measures formation, Fossils are plentiful in most of the rocks here. The most common finds are various plant and lycopod remains, however, in some of



the shale blocks, various fish remains can easily be collected. Carefully splitting quickly reveals teeth, bones and scales, most of the remains are from a species of rhizodont.

Although this species can grow to up to six meters, the fossil remains here are much smaller and possibly are from juvenile fish. Some larger fossil teeth do appear and these suggest a fish at around 1-2 meters in length. Rhizodonts have a mouth full of very sharp teeth and have four large fangs at the front of their mouth.

All the fish remains are isolated fragments and many are broken indicating how effective the rhizodonts were of chewing up prey (including each other!). Other small fish remains appear and seems to be from the smaller species such as the Actinopterygians (ray finned fishes) *Elonichthys* and *Mesopoma*.

Plant fossils are extremely common in all the rocks here and pieces of the roots of the *Lepidodendron* (*Stigmara*) are often are just lying on the surface.

There are some rare fossils which occur namely shark teeth and very small amphibian bones. These are very rare but give a good understanding to the palaeoenvironment at the time these rocks were laid down. It is worth noting there is no bed rock here as everything has been dumped, so there is no real way of pinpointing exactly where the rocks are from, and their place in the stratigraphy.



If you continue further up the B741 you will come across another large mine called Pennyvennie which is in the process of regeneration. Many large spoil heaps remain and these contain various lycopods, worm burrows, bivalves and occasional fish remains. The fish remains are not as common as the afore mentioned heap, but some nice specimens can be obtained with a little patience. At the time of writing access has been allowed by asking the site workers, but this may change when the regeneration

reaches these spoil heaps. Within this mine area, there is a large impressive late Carboniferous dolerite sill on the side of Benbeoch hill (see photo) which is around 463 meters high. Thankfully it will not be part of any regeneration plans.

After a short drive up the B741 again you will see a very overgrown spoil heap on the right hand side. Fossils do occur here but are all badly weathered. The spoil heap is also badly overgrown and contains industrial brickwork etc. Please note that working with spoil heaps is potentially very dangerous as slopes are unstable. However, if you want go to these places it would be at your own risk.

### **Lectures from other Societies**

Edinburgh, Highland and Westmoreland Geological Societies are all delivering a variety of in-person and on-line lectures. Members of the Glasgow Society are welcome to join these talks - contact the relevant secretary by email to get an invitation.

#### **Edinburgh Geological Society**

**1 December 2021 - Mark Wilkinson, Edinburgh University**

Why are the Highlands high? Cenozoic uplift and erosion in Scotland

**19 January 2022 - Charles Wellman, Sheffield University**

Life on land one-billion years ago: barren wilderness or evolutionary cradle?

**2 February 2022 - Florian Fousseis, Edinburgh University**

How x-rays and neutrons allow us to challenge established concepts in tectonics

**9 February 2022 - Kevin Smith, BGS**

The Forties (Rattray) Volcanic Province in the Central North Sea 1970 – 2020

**16 February 2022 - Mark Austin, Alba Minerals**

Clogau Gold Mine exploration, North Wales

#### **Aberdeen Geological Society**

**2 December 2021 - Charles Wellman, University of Sheffield**

Early Life – Microbial evidence within the Torridonian of Scotland

**20 January 2022 - Rachel Brackenridge, University of Aberdeen**

Making waves - 'Tsunamis in Scotland'

**3 February 2022 - Hugh Morel, Aberdeen Geological Society**

Seismology introduction - Experiences - Living on & Monitoring the Highland Boundary Fault

**17 February 2022 - John Heathcote, HGS**

Hydrogeology - The Amazing Behaviour of Water within Rock

#### **Highland Geological Society**

**19th January 2022, Rachel Wignall, NatureScot.**

NatureScot and geoconservation

**9th February 2022, Elsa Panciroli**

title tba

#### **NW Highlands Geopark**

**9 December 2021 - Maarten Krabbendam - BGS**

Torridon and Morar sandstone: detritus from the largest mountain belt on Earth

**13 January 2022 - Alastair Mitchell**

A Collector's Obsession with the Highlands Controversy

**10 February 2022 - Colin McFadyen- NatureScot**

Geoheritage conservation in the NW Highlands Geopark

### **Westmorland Geological Society**

**19 January 2022 - John Marshall - University of Southampton**

UV-B radiation was the terrestrial killer at the Devonian – Carboniferous boundary

**16 February 2022 - AGM and Presidential Address**

### **Royal Scottish Geographical Society**

**1 December 2021 - Colin Ballantyne**

The Vanishing Arctic (free to members, others £6)

### **Scottish Journal of Geology**

One of the benefits of membership of the Society is the receipt of printed copies of the Scottish Journal of Geology, usually published twice a year. In common with most scientific publications the SJG has already moved to a 'Continuous Publication model', affording authors early distribution of their articles prior to printing. The print version will cease being published in the near future and we encourage members to regularly check the SJG home page at the Lyell Collection <https://sjg.lyellcollection.org/>

You can login and setup an account with the Lyell Collection with your Society membership number and additionally setup email alerts whenever new content becomes available.

Volume 57 Issue 2 (Nov 2021) is about to be issued.

### **Other Articles on Scottish Geology**

There are often some key papers in the literature on aspects of Scottish geology which were not published in the SJG (ed. maybe they should?). Some key recent papers that you may be interested in reading are listed below. Contact me if you have difficulty accessing any of these. More to follow in subsequent newsletters!

KRABBENDAM, M., STRACHAN, R & PRAVE, T. (2021): A new stratigraphic framework for the early Neoproterozoic successions of Scotland. *Journal of the Geological Society*. [In this important paper the authors propose three new 'Megasequences' to cover what we traditionally refer to as the Torridonian, Moine and Dalradian]. OPEN ACCESS

<https://doi.org/10.1144/jgs2021-054>

STRACHAN, R.A., et al., (2020): A Baltic heritage in Scotland: Basement terrane transfer during the Grenvillian orogeny. *Geology*, **48**, 1094–1098. [The authors propose that the Northern Highland Terrane basement was a fragment of Baltica that was emplaced onto Laurentia during the Grenvillian orogeny, representing a further example of basement terrane transfer in the circum–North Atlantic orogens].

<https://doi.org/10.1130/G47615.1>

FINLAYSON, A (2020): Glacial conditioning and paraglacial sediment reworking in Glen

Croe (the Rest and be Thankful), western Scotland. *Proceedings of the Geologists' Association*, **131**, 138–154.

<https://doi.org/10.1016/j.pgeola.2020.02.007>

SEARLE, M.P. (2021): Tectonic evolution of the Caledonian orogeny in Scotland: a review based on the timing of magmatism, metamorphism and deformation. *Geological Magazine* 1-29. [Recent paper from our speaker in October 2021].

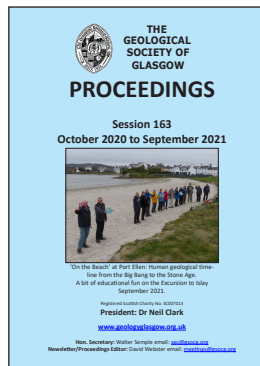
<https://doi.org/10.1017/S0016756821000947>

## **Proceedings Session 163**

The Proceedings booklet for Session 163 has now been published and Members with email addresses will have been sent a download link to the pdf version via email. Others will be posted a hard copy. If you wish a hard copy in addition to your pdf version please email the membership secretary [memsec@gsocg.org](mailto:memsec@gsocg.org).

## **Obituaries - Session 163**

The Proceedings Booklet contains obituaries for former members of the Society - Alan Hall, Mike Arrowsmith and Donald Bowes. They will be missed and our thoughts are with their families.



## **The outcome of COP26 – what does it mean for geoscience?**

A very readable and informative blog article from the Geological Society of London. Link here <https://blog.geolsoc.org.uk/2021/11/19/the-outcome-of-cop26-what-does-it-mean-for-geoscience/>

## **Subscriptions & Memberships**

There are still a number of members who have not paid their subscriptions for the current session. Membership will lapse unless you bring any arrears up to date. Please contact the Membership Secretary if you need details on how to pay or renew your membership

The uncertainties surrounding the lecture programme renders the usual membership card somewhat obsolete, however if you require evidence of membership please contact the Membership Secretary: email : [memsec@gsocg.org](mailto:memsec@gsocg.org)

## **Keeping in Contact**

If you have access to an email address but have not given it to the Society you are likely to miss out on much of the planned geological events during this pandemic. If you do wish to get online then please let us know your email address.

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**Hon. Secretary:** Walter Semple email: [sec@gsocg.org](mailto:sec@gsocg.org)

**Newsletter Editor:** David Webster email: [meetings@gsocg.org](mailto:meetings@gsocg.org)