

# THE GEOLOGICAL SOCIETY OF GLASGOW

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# President: Dr. Neil Clark

## www.geologyglasgow.org.uk

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163/3

A geological map of Wales. How did these and related rocks in Ireland, England and Canada assemble on the edge of Gondwana, cross the lapetus Ocean and eventually arrive on Laurentia? Find out more about this incredible journey at the lecture by David Schofield on 11th March.

Map credit: BGS (http://earthwise. bgs.ac.uk/index.php?curid=12208)

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# **Lecture Meetings**

All remaining lectures for this session will be held virtually using Zoom. Meetings commence at 7.30 pm. Joining details will be emailed to those members for whom we have an email address. For more information please contact the Meetings Secretary: meetings@gsocg.org

## <u>Thursday 11<sup>th</sup> March 2021</u> Dr. David Schofield, British Geological Survey, Edinburgh.

### **Terrane tectonics in southern Britain**

During the 1970s, the recognition of allochthonous terranes as discrete lithospheric fragments gave geologists a new tool kit to help describe the mosaiclike complexity of orogenic belts. Understanding that terranes could be dispersed and recombined accompanied realisation that strike-slip translation contributed significantly to orogenic development.

In applying this to understanding the, largely concealed, late Neoproterozoic and Lower Palaeozoic record of southern Britain, conflicts in nomenclature, scales of observation and focus of the geologist's themselves



has led to a confusing picture where terranes are essentially reduced to snapshots in time rather than lithospheric entities evolving in both time and space.

This talk takes a look at this problem and uses summaries of isotopic data to contrast Neoproterozoic rocks with their Cambrian cover successions in southern Britain and those in the Caledonian-Appalachian Orogen as a whole, and looks at when the component terranes may have been assembled and largely stabilised.

Earlier interpretations of the orogeny compare southern Britain with Avalon Peninsula in Newfoundland based on the similarity of their Cambrian shelfal sedimentary successions and cold water faunas, known as East and West Avalonia respectfully. However, isotopic studies of the Precambrian basement to southern Britain show that it more closely resembles that of other terranes that formed around the continental margin of West Gondwana, Meguma of Nova Scotia and Ganderia of Central Newfoundland and New Brunswick of the northern Appalachians.

Similarly, U-Pb zircon provenance studies of the overlying Cambrian cover successions show that North Wales and the Midland Platform of England most closely resemble Meguma while those of Anglesey (Monian Composite Terrane) and the Leinster-Lakesman Terrane most closely resemble Ganderia. While in the northern Appalachians these terranes largely travelled separately before their accretion in a piecemeal fashion onto the continental margin of Laurentia; in the UK they were juxtaposed during the Early Ordovician Monian Orogeny, after which southern Britain and Ireland probably travelled as a single terrane before arriving on Laurentia during the Silurian. David undertook a PhD at Keele University in 1995 and has worked with the BGS in various roles since then. Currently he is Director, Energy Systems and Basin Analysis, having previously been Chief Geologist, Wales.

### **Background reading:**

SCHOFIELD, D, LESLIE, A.G., WILBY, P.R., DARTNALL, R., WALDRON, J.W.F & KENDALL, R.S. (2020): Tectonic evolution of Anglesey and adjacent mainland North Wales, In: Murphy, J. B., Strachan, R. A. and Quesada, C. (eds) *Pannotia to Pangaea: Neoproterozoic and Paleozoic Orogenic Cycles in the Circum-Atlantic Region.* Geological Society, London, Special Publications, **503**, pp. 371-390.

WALDRON, J.W.F., SCHOFIELD, D.I. & MURPHY, J.B. (2019): Diachronous Paleozoic accretion of peri-Gondwanan terranes at the Laurentian margin. In WILSON, R. W., HOUSEMAN, G. A., MCCAFFREY, K. J. W., DORÉ, A. G. & BUITER, S. J. H. (eds) *Fifty Years of the Wilson Cycle Concept in Plate Tectonics*. Geological Society, London, Special Publications, **470**, 289–310.

WALDRON, J.W.F., SCHOFIELD, D.I., PEARSON, G., SARKAR, C., LUO, Y. & DOKKEN, R. (2019): Detrital zircon characterization of early Cambrian sandstones from East Avalonia and SE Ireland: implications for terrane affinities in the peri-Gondwanan Caledonides. *Geological Magazine*, **156**, pp. 1217–1232.

### Thursday 8th April 2021

### Dr Queenie Chan, Royal Holloway, University of London

### **Catching a Shooting Star**

It is not easy to catch a shooting star, but when we find one, we make the most out of it by studying it in every detail to learn its secrets. Although the building blocks of life in meteorites could be vulnerable to extreme conditions, e.g. toasty temperature during a meteorite's fiery entry into the atmosphere, the interiors of meteorites are buffered from those conditions. Trapped liquid water and life's precursor molecules could have been preserved like "mosquito in amber" and therefore studied in the laboratory.

Queenie Chan is a planetary scientist. Her work involves the analysis of the chemical and organic contents of astromaterials including meteorites and asteroidal/cometary samples returned by space missions. In this talk, she will discuss how water and life's simple building blocks were delivered to the early Earth.

Queenie completed her PhD in Planetary Science at Imperial College in 2011, and undertook post-doctoral assignments at the Japan Agency for Marine-Earth Science and NASA Johnson Space Center. Until 2020 she was with the Open University and has recently been appointed Technology Lecturer at Royal Holloway, University of London.

**Background reading:** CHAN, Q. H. S. et al., (2020): Organics preserved in anhydrous interplanetary dust particles: Pristine or not? *Meteoritics & Planetary Science*, **55**, pp. 1320-1348.



## Thursday, 13th May 2021

### **Members' Night**

Short presentations by members of the Society. Members' Night is an opportunity for Society members to give short presentations or displays about their own interests and adventures in geology. If you are interested in presenting then please contact the Hon Secretary, Walter Semple, by email at <a href="mailto:sec@gsocg.org">sec@gsocg.org</a>

### **Recordings of Lectures**

Recent past lectures have been recorded and uploaded to YouTube. Some speakers request that the recording only be kept online for a limited time. The following are still online:

<u>David Beerling:</u> Large-scale CO2 removal via enhanced rock weathering <u>https://youtu.be/BNDfs6KpDxo</u> <u>Tim Kearsey:</u> Palaeosols as evidence of terrestrial climate change at major Palaeozoic vertebrate evolutionary events <u>https://youtu.be/HuZpuY8lvw0</u> <u>Doug Robinson:</u> Geology of the Mendips <u>https://youtu.be/ggTPdJ3VcVo</u>

These and other recordings can be found on my YouTube channel, which you can subscribe to: <u>https://www.youtube.com/channel/UCnvq23gfJdfTtghqq4REw7Q</u>

# Day & Residential Field Excursions 2021

As you will be aware at this stage we cannot commit to formal field excursion programmes, although we hope to be able to offer some small-scale local events in the summer months. We may have a better idea of what is possible in time for the next newsletter (early May), and we will keep members up to date by regular emails.

# Scottish Geology Trust Update

Following its formation and recognition by OSCR in November 2019, the Scottish Geology Trust held its first AGM on 24 February 2021. 111 members and visitors attended the zoom meeting. At the date of the meeting the trust had 259 paid up members including many from elsewhere in the UK and 14 from other countries. Numbers were now increasing by about 10 per month.

The trust income for the ended 31 December 2020 was around  $\pm$ 53,000 from members subscriptions and donations, generous charitable donations and a successful crowd funding campaign. At the end of the year after expenditure the account totalled  $\pm$ 31,000.

During 2020 the trust has been directed by nine active trustees from across Scotland and following a call for new trustees, four members volunteered. All were elected to serve. The trustees have assembled a team of three experienced paid consultants: the project manager, a fundraiser and a PR /media expert, all well qualified to take the work forward. Much was also achieved by the team of willing and able volunteers. The future work programme is divided into four sections: Public Engagement, Geoparks, Education and Campaigning.

Thanks to the hard work and enthusiasm of the trustees and the consultants, and the frequent use of Zoom meetings a great deal has been achieved in a short time. The unique contribution of the Trust is its national perspective on the issues faced by the Geology Community in Scotland. The prospects for the future are encouraging.

More information at <a href="https://www.scottishgeologytrust.org/">https://www.scottishgeologytrust.org/</a>

# **Report on Annual General Meeting**

The AGM was held virtually on Thursday 10<sup>th</sup> Dec 2020. Thanks were expressed to all Council Officers for their work during the recent session, and particularly to those who had come to the end of their term of office. The customary officers' reports were presented. Following the election / re-election of Council Officers, Council now comprises the following:

President	Neil Clark
Hon. Secretary	Walter Semple
Vice President	Brian Bell
Vice President	Simon Cuthbert
Treasurer	lan Veitch
Meetings Secretary	David Webster
Membership Secretary	Campbell Forrest
Excursions Secretary (day)	Roy Bryce
Excursions Secretary (residential)	Maggie Donnelly
Librarian	Vacant
Asst Librarian and Hon. Archivist	Margaret Anderson
Proceedings Editor	David Webster
Publications Officer	Vacant
Webmaster	Bill Gray
Web Consultant	Neil Clark
Newsletter Editor	David Webster
Junior Representative	Matthew Staitis
Editor of SJG	Vacant
Editor of SJG	Colin Braithwaite
Ordinary Member	Mina Cummings
Ordinary Member	Gary Hoare
Ordinary Member	lan Millar
Ordinary Member	Anna Milligan

It was agreed unanimously at the AGM that Professor Donald Bowes should become an Honorary Member of the Society.

## **Obituary: Allan J. Hall**

#### 1946-2021

Allan James Hall was born in Dunfermline on 23rd December 1946 to James and Christina and was the younger brother of Ken. Allan met his wife, Irene, at Dunfermline High School and they married in 1967 while he was still an undergraduate in the Grant Institute of Geology, The University of Edinburgh. As a couple they moved around for the next 10 years, first to Durham for Allan's PhD then to Paris as a post-doc and a brief spell at Newcastle before settling in Bothwell when Allan joined the Department of Applied Geology at the University of Strathclyde. The Bothwell house was to be the family home until his death on 1st January 2021 at the age of 75. Michael was born in 1978 and Malcolm followed in 1980. Irene was a primary school teacher and after the



boys were older she returned to teaching in a role of support for learning and inclusion. Sadly, she passed away in 2008, only three years before Allan retired. Theirs was a happy home with lots of laughter, family outings on bicycles and family holidays in the UK and further afield, often on the back of Allan's attendance at conferences. Allan had an easy-going nature and was a patient father encouraging his sons to be inquisitive. In the 1980s they visited California and in 1991-92 Allan had a sabbatical when they went to Australia and New Zealand.

Allan was always keen to embrace new technologies and was quick to adopt home computing. Both sons graduated with degrees in computing science from the University of Glasgow. A few years after retiring in 2011, Allan was diagnosed with PSP – progressive supranuclear palsy, a rare condition which increasingly led to problems with balance, mobility and, later, speech. These physical problems didn't diminish his desire to be involved with his archaeological research or attending lectures of the Geological Society of Glasgow which he did up until the first Covid-19-induced lockdown in March 2020.

Michael married Maria in 2018 and Allan became close to Maria's family, especially her mother Bridget. Malcolm was working in the USA but returned to the family home as Allan's carer when his illness progressed. Both sons were instrumental in providing the care and engaging support services that allowed Allan his wish to remain in his own home to the end. Special mention must be made of his personal assistant, Grzegorz (Greg), who provided daily care, healthy nutritional meals and outings to local parks for Allan.

As an undergraduate, Allan would commute from the family home to the university on his scooter over the Forth Bridge. For a time he was involved with the student newspaper. Following his graduation with a first class honours degree in geology in 1968, Allan and Irene moved to Durham where he spent 3 years studying synthetic sulphosalts, especially tetrahedrite, under the supervision of Roy Phillips. His thesis of 1971 was on The mineralogy of some synthetic sulphosalts. There followed a post-doctoral position at the Université de Paris and a brief post in Newcastle University before Allan was appointed a lecturer in the young Department of Applied Geology at the University of Strathclyde in 1976. He was instrumental in changing the culture within the department by bringing together the academic and technical staff socially to appreciate that success could only be achieved by working collaboratively. In 1989, Allan moved, with the rest of the staff and students, to the University of Glasgow to form the new Department of Geology and Applied Geology. Following increasing collaboration with Drs Richard Jones and Effie Photos-Jones, in 1998 he transferred into the Department of Archaeology where he remained until he retired. In Archaeology, he investigated industrial minerals in Greece and early metal exploitation in Scotland, conducted geomorphological surveys around the River Earn and had his share of undergraduate teaching and supervision of research by BSc, MSc and PhD students.

Most of Allan's research was funded by small to moderate grants from mining companies, charities or government departments, but he was co-Principal Investigator on a large grant studying the origin of life on Earth in collaboration with Mike Russell resulting in papers in the late 1990s and research which continued till the end of his active academic life. His research has focused on understanding the chemical behaviours of ore and industrial minerals using standard and novel techniques. Mentioning some of the topics he investigated shows his breadth of interests: gold mineralisation, laser isotope analysis, redox behaviour of iron sulphides, carbonation of concrete, methanogenesis, sulphur isotopes, emergence of life – on Earth and on Mars, the socio-economic significance of industrial minerals in antiquity, historic mortars, lead isotopes in musket balls, Bronze Age copper mining in Greece,  $CO_2$  in Scottish rivers, Mediterranean sugar, Al geochemistry in early medicines and the post-glacial geomorphology of Strathearn.

Allan was unassuming, kind, generous with his knowledge and an accomplished academic; he is proud of the success of his research students whom he encouraged to publish while still working on their PhDs. He supervised 14 research students and was a mentor to many more, such was his approachability and unselfish willingness to share his knowledge.

Allan was the author of almost 100 scientific papers with almost as many co-authors covering a wide diversity of research areas. In addition, he authored a similar number of reviews, conference abstracts and unpublished reports. Collaborating with Colin Gribble, Allan wrote the first student textbook to combine transmitted and reflected light microscopy. He was a member of the Mineralogical Society of Great Britain and Ireland for which he was on the committee of the Applied Mineralogy group and the organising committee for its 1994 conference.

In addition to his teaching duties, he took a major role in admin tasks including the departmental lead for the first research excellence survey. Allan served on a variety of committees for the departments, faculty and the university as well as on national bodies. He oversaw the running of the XRD laboratory with Murdoch Macleod and Dugald Turner and the polished section laboratory with John Gilleece. In Archaeology,

he was convenor of the Technical Liaison Committee for many years and established lunchtime "science" talks. He was an adviser of studies for all of his time in the University of Glasgow, first for geology students then for those studying archaeology.

Allan joined the Geological Society of Glasgow in session 125 (1982-1983) and was elected on to Council in December 1988. He was President from 1st December 1991 to 8th December 1994 (sessions 134-136). This was also the final three years of Janey MacDougall's long service as secretary. During his tenure, he led an excursion to the northern Lake District and another to East Kirkton and the Bathgate Hills. He also presented the 9th and 10th Professor George Memorial Medals to W. J. Kennedy and Diane Edwards.

Allan is survived by his sons, Michael and Malcolm, and by his brother, Ken.

lain Allison



# **Trearne Quarry Update**

As many of you may be aware, Trearne Quarry has been undergoing a regeneration by the current owners. Various key SSSI faces have been protected against any remedial work. However, this has not protected any of the fossil bearing rocks in the spoil heaps.

I have been visiting Trearne for 16 years and photographing the faces as they appear and disappear, as well as collecting fossils. In the last few years all the spoil has vanished and the entire northern bay is now a grassy field.

As pretty and safe as this may be, I find it very sad that the fossil collecting opportunities have almost vanished. As Stan Wood once said "Scotland has enough grassy spaces" Yes there are wonderful sections to view and in theory a grassy covered coral reef exists. But the imported mud and grass is liberally a few centimetres from the bottom of the faces so any rock or fossil that does fall basically is hidden from view.

In the spring of 2019 I discovered a second good section of the jellyfish bed which was earmarked to be landscaped and grassed over –basically 2019 was a rescue mission to secure as many specimens as possible from this quarry! The "jellyfish bed", which is just a thin horizon in the Blackhall limestone, yielded around 115 complete fossil jellyfish as well as orthocones, sponges, trilobites, rare eurypterid and some other soft bodied remains. All these specimens are in a remarkable state of preservation.



I collected as many as I could but I know there were so many more buried for eternity. After the regeneration is complete and full access granted, I plan on re-writing a field/ collecting guide as the current GSG guide to Geological Excursions around Glasgow & Girvan is now out of date and many of the features described in this guide are no longer visible for example the dyke has been completely buried.

I hope to also organise a trip for GSG members to come and see the quarry again and I believe the Canny Man would be an excellent venue again for a meal. On the positive side there have been various new rock faces exposed during the regeneration which has opened up some fantastic short term collecting opportunities, including rocks containing various corals from the reef beds.

I hope to continue visiting the quarry on a regular basis to keep a photographic record of the regeneration, and these will be logged with NatureScot. In the next issue of the Scottish Journal of Geology I have published a paper on my crinoid studies, naming new species to the quarry. Up until now only two nominal species had been written about. A further paper will be submitted listing all species from the fossil fauna of Trearne and will add some unrecorded species to the area.

If anyone has any pictures of Treane or of fossils from it, I would love to see these and can be contacted on <a href="mailto:garyhoare@live.com">garyhoare@live.com</a>

### Gary Hoare

### Further Reading

HOARE, G & DONOVAN, S.K. (2021): New records of crinoids from Trearne Quarry SSSI (Mississippian, Lower Carboniferous), north Ayrshire. *Scottish Journal of Geology*, <u>https://doi.org/10.1144/sjg2020-012</u>

# **Update on Fossil Grove**

Further roof and drainage repairs are in progress, funded by the Fossil Grove Trust. Friends of Victoria Park have been helping out by clearing gutters and rubbish in conjunction with their fernery project. The Trust is in discussions with the Council on taking out a management lease and are currently reviewing tenders received for professional help in assessing and costing future options. <u>www.fossilgroveglasgow.org</u>

# **Courses at the Glasgow University Centre for Open Studies**

### Introduction to Earth Processes (Online Course) 7 March-1 Sept 2021

This course explores the scientific evidence for models of the Earth's evolution and internal structure, and how this complements geological evidence for the theory of plate tectonics.

More information and booking instructions

https://www.gla.ac.uk/study/short/book/index.html/course/ADED1060E

# **Geo-Crossword**

### Across

3. Intermediate extrusive volcanic rock named after a South American mountain range.(8)

6. Animal that the Middle Jurassic of Skye is famous for leaving traces of on Skye. (8)

7. The study of fossil soils. (14)

8. Precambrian rock unit named after an hebridean island. (5)

13. Geological inlier where the Society organised Camp Siluria over 100 years ago. (10)

- 14. Fossil from Dumbarton that closed Romer's Gap. (8)
- 15. Huge ocean that closed during the Caledonian Orogeny. (7)
- 18. Terms used to describe a metamorphosed sandstone. (12)

20. Rock commonly made up of small spherical calcium carbonate with concentric layers. (6)

23. Sedimentary rock based on the Latin for sand. (7)

24. Mrs Elizabeth Gray's old picnic area where she found many Ordovician trilobites.(6)

25. Famous past president of the Geological Society of Glasgow who has a temperature scale named after him. (6)

26. Rare igneous rock found near Lennoxtown, used to trace the movement of ice. (8)

### Down

1. Metamorphic gold-bearing rocks north of the Highland Boundary Fault. (9)

2. Mineral named after a town in the Highlands of Scotland translated as 'the nose of the fairy hill'. (12)

- 4. A coarse-grained basalt. (6)
- 5. The Palaeozoic Period that resulted in most of the coal fields in Scotland. (13)
- 9. Rare rock type formed as mafic rocks are subducted under the crust. (8)
- 10. Place made famous by the discovery of a 330 million year old shark. (8)
- 11. The first Gaelic named Scottish Ichthyosaur. (10)
- 12. Minerals or rocks rich in magnesium or iron. (5)
- 16. Major orogenic era that brought England and Scotland together (geologically). (10)
- 17. Looking after our geodiversity for the future. (15)

19. Island where the ejecta from a Palaeocene meteorite impact has been detected. (4)

21. Rock type penetrating schist in Glen Tilt Hutton used to contradict the theory of Neptunism. (7)

22. Town in Kincardineshire at the eastern end of the Highland Boundary Fault. (10)

# **New Members**

**Welcome to the following:** Chloe Charlton, Iain Jenkins, Anne Cockroft, Alan Thomson, J Brint, Angus Miller, Dave Longstaff, Bob Morley, Alison Kerr, Darren Page, Jaccqueline Hamilton, Ken Muir, Stephanie Wood, Martin Dahlgren, Roger Dunshea, Andrea Pearson, Nick Pierpoint, Alan McGregor, & David Graham.



# Subscriptions

The membership fees for the Society are as follows:

- Ordinary Membership (including Scottish Journal of Geology): £25
- Associate Membership (available to those over 60, or spouses of Ordinary Members, or members of the Edinburgh Geological Society but does not include the Scottish Journal of Geology): £12.50
- Junior Membership (available to those under 25, or full-time undergraduates, or recent (4years) graduates: £6.25. (Junior members who pay a £ 6.25 supplement will also receive the Scottish Journal of Geology.)

Any queries to: The Membership Secretary: Campbell Forrest, email: <u>memsec@gsocg.org</u>

# **Events from other Geological Societies and Organisations**

### Edinburgh Geological Society www.edinburghgeolsoc.org

3 March - Tom Challands: Scottish palaeontology in the 21st century

17 March - Heather Stewart: Exploring the Underworld: The geomorphology and sediments of subduction trenches

Recordings of previous lectures are available on their website.

### Highland Geological Society www.spanglefish.com/highlandgeologicalsociety

18 March -Cherry Lewis: The Dating Game: One Man's Search for the Age of the Earth

21 April - Mile Simms, Dawn of the Modern World: Life, Death and Rain in the late Triassic

### NW Highlands Geopark www.nwhgeopark.com

Geoheritage Festival Events

11 March - Rob Butler: How the mountains of Foinaven and Arkle inspired geological understanding of the Alps and Himalayas

25 March - Rob Wilson: Trees, Climate and the Act of Union

25 April - Keith Milne: Mapping the Assynt Thrust Structures : Three Centuries of Discovery and Changing Technology

### Geowalks www.geowalks.co.uk

2 March - Mull: A walk on the wild side

4 March - Northern Isles

16 March - Mull: Loch Buie to Carsaig

30 March - Mull: Why is Mull so special?

### Geological Society of London https://www.geolsoc.org.uk/space21

Year of Space 2021: Planetary Geology Series

3 March - Mercury

22 April - Venus

See their website for dates of subsequent talks plus previous recordings.

### Open University (Space Science Club)

14 April - Natalie Starkey: Catching Stardust

https://www.eventbrite.co.uk/e/catching-stardust-a-talk-by-dr-natalie-starkeytickets-140050664307

If you hear of or attend another talk/video that might interest the membership then please email me at <a href="mailto:meetings@gsocg.org">meetings@gsocg.org</a>

Hon. Secretary: Walter Semple email: <u>sec@gsocg.org</u> Meetings Secretary/Newsletter Editor: David Webster email: <u>meetings@gsocg.org</u>

