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North West Highland Expedition, June 2018. Image courtesy of Robert Anderson.

Twenty-one doughty Friends gathered at Ullapool on June 13<sup>th</sup> 2018 for the start of a five-day visit to the North West Highlands Geopark. They had variously travelled by train, road and plane.

Central in this photograph is our Geopark guide, Peter Harrison, explaining the local deformation. He was knowledgeable, enthusiastic and ever patient with us Friends and our foibles. He introduced us to the stunning scenery of the North West Highlands, from Ullapool to Cape Wrath and from Point of Stoer to Loch Eriboll, and to the geological events that created this landscape.

Read more on page 8.

**The Sedgwick Museum of Earth Sciences, Downing Street, Cambridge CB2 3EQ**

**Opening hours:** Monday to Friday 10am–1pm & 2pm–5pm Saturday 10am–4pm

☎ (01223) 333456 ✉ [sedgwickmuseum@esc.cam.ac.uk](mailto:sedgwickmuseum@esc.cam.ac.uk) 🏠 [www.sedgwickmuseum.org](http://www.sedgwickmuseum.org)

✉ **Friends of the Sedgwick Museum** [friendsofsedgwickmuseum@esc.cam.ac.uk](mailto:friendsofsedgwickmuseum@esc.cam.ac.uk)

📘 <https://www.facebook.com/Friends-of-the-Sedgwick-Museum-508873495923670/>

## FRIENDS FORTHCOMING EVENTS

Unless otherwise clear, Friends talk events will be held in the Department of Earth Sciences, Downing Site, Cambridge CB2 3EQ. The doors to the department will be opened at 6.15pm for tea/coffee, and the talk will start promptly at 7pm. Please try not to be late, in spite of Cambridge traffic congestion, because our doors have to be locked at 7pm.

Cars may be parked on the Downing Site during these events. The entrance for cars is from Tennis Court Road, opposite the back entrance to Pembroke College, through the “Visitor’s” barrier gate taking a paper ticket. Identify yourself as attending a “Friends of the Sedgwick Museum” event, if requested by security. After the talk, cars must leave using the exit barrier at the other (Downing College) end of the site.

Members attending a Friends talk are asked for a donation of £2 each (or £3 for non-members).

Please note that events with a star \* need to be pre-booked. Please use the standard booking form which is found on Pg.19 of this Newsletter and is also on our website

### September – December 2018

#### 17-21 September: visit postponed

Our visit to the North Yorkshire Moors has been postponed to 2-6 September 2019. Any member who registered for the 2018 visit is on the list for 2019 unless they stated otherwise.

#### Tuesday 9 October: Committee Meeting

6pm in the Department of Earth Sciences.

#### Tuesday 23 October: New work on late pre-Cambrian, Ediacaran life

Talk by Charlotte Kerchington, PhD student, University of Cambridge. See article on page 6. Doors open at 6.15pm for 7pm.

#### Tuesday 13 November: Could the future of green, low carbon technologies be based on 1 billion-year old intrusive rocks in southernmost Greenland?

Talk by Callum Reekie, PhD student, University of Cambridge. Doors open at 6.15pm for 7pm.



Dr Emma Liu, Leverhulme Research Fellow in Volcanology

#### Tuesday 27 November: Monitoring volcanos, using unmanned aerial vehicles (UAVs)

Talk by Emma Liu, Leverhulme Research Fellow, University of Cambridge. Doors open at 6.15pm for 7pm.

### **Tuesday 4 December: Friends' Christmas Party**

Now a very successful tradition, in which snack-supper refreshments provide a background to talks by members of the student Sedgwick Club, describing their adventures over the previous year. The party will be held in the Department from 6–8pm. Please use our event booking form, and send it with a cheque for £8.00 (to cover the refreshments) to our Registrar: Carol Franklin, 273 Wellbrook Way, Girton, Cambridge, CB3 0GL. Please try to bring one or two suitable prizes for our raffle. Any surplus from the refreshment donations will add to our Museum support funds, and the more friends and guests who come the more enjoyable the party will be.

## **January to September 2019**

### **Tuesday 8 January: Committee Meeting**

6pm in the Department of Earth Sciences.

### **Tuesday 22 January: Diagnostic properties of Common Minerals**

Another of the popular “Experimental geology” classes run by Dr Mike Tuke.  
Doors open at 6.15pm for 7pm.

### **Tuesday 5 February: Birdwatching through geological time**

Talk by Dr Daniel Field, new University of Cambridge Lecturer.  
Doors open at 6.15pm for 7pm.

### **Tuesday 12 February: Glacial Mars: Ice and Water on the Red Planet**

Talk by Frances Butcher, PhD student, Open University.  
Doors open at 6.15pm for 7pm.

### **Tuesday 26 February: Two legs or four? How did reptiles evolve into dinosaurs?**

Talk by Luke Grinham, PhD student, University of Cambridge.  
Doors open at 6.15pm for 7pm.



### **19-21 March: Adam Sedgwick Birthday Celebration Dinner\***

Venue and date yet to be agreed.

### **Tuesday 23 April: Committee Meeting**

6pm in the Department of Earth Sciences.

### **15-24 June 2019: Visit to the Western Alps of France\***

Dr Mike Tuke is acting as the Registrar for this field trip which will make a NW-SE transect, looking at the amazing rocks and structure. The party will be staying in a number of hotels starting and finishing in Grenoble. Further information is available from Dr Mike Tuke at [miketuke@btinternet.com](mailto:miketuke@btinternet.com) and he has request initial contact with him by the end of July 2018.



[www.cambsgeology.org](http://www.cambsgeology.org) Affiliated Group of the Geologists' Association

## Monthly Talks Programme September 2018 – March 2019

The Society meets at The Friends Meeting House, 91-93 Hartington Grove, Cambridge CB1 7UB

Lectures start at 7.30pm and doors open at 7.00pm

Visitors (£3 per person) and Members (free) are welcome

Contact: Franziska Norman, Programme Secretary [info@cambsgeology.org](mailto:info@cambsgeology.org)

### Monday 8 October 2018

TBA

### Monday 10 December 2018

**“Bob Dylan and the Bone bed: A sideways glance at the Rhaetic (aka Penarth Group) exposed in Aust Cliff, S. Gloucestershire” Reg Nicholls, Cambridgeshire Geological Society**

The period that used to be known as the Rhaetic forms a thin ribbon between the Triassic and Jurassic running NE across the spine of Britain. It is a time of halting marine transgressions and holds the evidence of a major extinction period affecting many groups of marine life. The cliffs exposed under the English side of the 1<sup>st</sup> Severn Bridge allows an excellent view of these rocks as well as an opportunity to search for a wide range of fossils – including vertebrates. Just search amongst the Rolling Stones.

### Monday 14 January 2019

**“Ediacaran microfossils” Peter Adamson, PhD student, Department of Earth Sciences, Cambridge**

More information on these enigmatic fossils from a time that is a ‘hot topic’ in evolutionary research.

### Monday 11 February 2019

**“Close encounters of the third (geological) kind...” Steve Thompson, Exploration Geologist, Cambridge**

The geology of Sao Tome & Principe, islands in the Gulf of Guinea, off the western equatorial coast of Central Africa. Learn about the Cameroon Volcanic Line, the Pico do Cão Grande, and other features of this archipelago that forms the second smallest state in Africa.

### Monday 11 March 2019

**“Mantle variability and magmatic processes beneath the Galapagos Archipelago” Matthew Gleeson, PhD student, Department of Earth Sciences, Cambridge**

Most people know the Galapagos for their evolutionary significance and for their iconic wildlife. Their geology is equally fascinating due to their tectonic setting with recent research revealing even more about their unique character.

## Celebrating “Rock and Life” and the 200 years since Adam Sedgwick became Professor of Geology

As Friends of the Sedgwick Museum, we have been enjoying celebrating Adam Sedgwick’s birthday (March 22 1788), with a Dinner on about that date every year. However, it has recently been pointed out that May this year (2018) would provide us with a further reason to celebrate his importance to Cambridge, geology and the history of our geological Museum. In May 2018 it was two hundred years since Adam Sedgwick was elected to the Professorship of Geology.

Our Friends’ Committee discussed possible special ways of marking this celebration, and we decided to arrange an evening of Music and Readings which took place, very successfully on Tuesday 5 June.

Key features of this celebration were the participation of the Galliard Trio, the central involvement of Douglas Palmer, the decision to hold the celebration in the Emmanuel United Reform Church on Trumpington St, and the enthusiastic turn-out of over forty of our Friends.

CELEBRATING 200 YEARS SINCE  
ADAM SEDGWICK BECAME  
PROFESSOR OF GEOLOGY

# ROCK AND LIFE

FRIENDS OF THE  
SEDGWICK MUSEUM  
WITH  
THE GALLIARD TRIO

A CHARITY CONCERT  
OF MUSIC AND READINGS  
TO SUPPORT  
THE GEOLOGICAL  
MUSEUM

JUNE 5, 2018. 7:30 PM  
AT EMMANUEL UNITED  
REFORMED CHURCH  
TRUMPINGTON ST, CAMBRIDGE  
CB2 1RR  
TICKETS £16 INC  
REFRESHMENTS

FOR TICKETS VISIT  
CAMBRIDGE LIVE TICKETS BOX OFFICE  
WHEELER STREET,  
(BEHIND THE GUILDHALL)  
CAMBRIDGE CB2 3QB  
CAMBRIDGELIVETRUST.CO.UK  
TEL: 01223 357851

ARIAS FROM HANDEL'S JULIUS CAESAR  
EXTRACTS FROM BIZET'S L'ARLESIENNE SUITE  
AND CARNIVAL OF THE ANIMALS  
BY SAINT-SAENS

The impact of the music played by the Trio in the acoustics of the Church was marvellous. Andrew Morris (flute and piccolo), Martin White (oboe and cor anglais) and Alec Forshaw (piano) thoroughly entered into the spirit of the evening, leading to a very enjoyable atmosphere of celebration and pleasure. Douglas Palmer’s lively readings on various aspects of the life of Adam Sedgwick were further enhanced by the contributions of Alex Dickinson (Departmental graduate student) who played the part of Adam Sedgwick using his version of a Cumbrian dialect. The whole evening was rounded off with wine and nibbles which allowed us to get to know the Trio better, and further celebrate together the remarkable story we had been enjoying. We feel that Adam would have thoroughly approved!

Organising an evening of this sort was a new experience for our Committee, but thanks to the support offered by a band of Friends who were not able to be present, and to “Cambridgelive”, who sold tickets for us, we raised a total of some £158 to contribute to further project work in our Museum

**Peter Friend, Chairman**

## When size first mattered and why



Artist's reconstruction of the community at Lower Mistaken Point  
Credit: Charlotte Kenchington

It was around 566 million years ago that metre-sized life appeared for the first time. These marine pioneer 'giants' were Ediacarans, members of an intriguing extinct group of soft-bodied organisms which inhabited Earth's tropical oceans in Late Proterozoic times.

Why this sudden boom in size from millimetres to metres happened has puzzled scientists for some time with the assumption being that it was for access to more or better food resources. But now, Emily Mitchell from the University of Cambridge and Charlotte Kenchington from Memorial University, Newfoundland have come up with a surprising and convincing alternative for the rangeomorph Ediacarans, which got bigger in order to spread their offspring further.

Read more about their research in the journal of *Nature Ecology and Evolution*: <https://go.nature.com/2MqnG1B>

### **Bigger for better offspring dispersal**

After more than 3 billion years of microbial evolution in the oceans, the rangeomorph Ediacarans were amongst the first of Earth's life-forms to grow to metre-scale in size. To understand why this occurred, Emily Mitchell and Charlotte Kenchington carried out a detailed spatial analyses of abundant fossil Ediacarans preserved on the ancient seabed strata of Newfoundland. Their results correlate increase in height by rangeomorph Ediacarans with greater offspring dispersal rather than competition for water-column food resources as had previously been claimed.

### **The Ediacaran biota**

The extinct Ediacaran organisms represent one of the most intriguing topics of current palaeobiological research. These puzzling fossils first appear in the fossil record around 575 million years ago and diversified into more than 200 different species throughout the tropical oceans of the world before becoming extinct around 541 million years ago. This mysterious Ediacaran biota was replaced by more familiar invertebrate organisms such as sponges, annelids, molluscs and arthropods.

Characteristically, the Ediacarans were soft-bodied, seabed dwelling organisms with immobile frond and disc-shaped bodies. Without distinct anatomical features for feeding or movement, they had ribbed or quilted bodies with high surface areas in relation to their body volume. As a result, it is generally thought that they acquired nutrients by direct absorption from the surrounding seawater.

### **Rangeomorph Ediacarans**

The development of frond-shaped rangeomorph Ediacarans dominated deep-sea ecosystems for some 15 million years. Some of them grew as flat fronds over the seabed but others developed rooted stem-like structures, which lifted their branched fronds off the seabed for close to 3 metres. It was the discovery in Newfoundland of these 2 metre sized ‘giants’ that prompted the question of what advantage size increase gave them and what drove it.



**Laser scanning Ediacaran Fossils**  
©Emily Mitchell

### **Mistaken Point, Newfoundland**

Surprisingly, it is the inhospitable rocky cliffs of Newfoundland’s Mistaken Point that has proven to be a mecca for palaeobiologists investigating the mysteries of the Ediacaran biota. Here ancient strata preserve astonishing numbers of fossils preserved as external moulds of the original soft-bodied organisms with remarkable detail on the ancient sedimentary rock seabed surfaces.

Since the fossils are preserved exactly where they lived and died, their diversity and abundance is thought to represent an unusually good ‘snapshot’ of the original seabed community. Most fossil assemblages have been modified to some extent or other from their original communities. The researchers analysed three separate large seabed assemblages, whose community composition differs but are dominated by rangeomorph Ediacarans that originally lived in deep-marine turbiditic environments.

Their analyses showed that there is no correlation between height and competition for food. The different Ediacaran organisms did not occupy different levels of the water column to avoid competition for resources. Rather the possession of stems for increase in height must have served another function. Mitchell and Kenchington found that the tallest rangeomorphs were surrounded by the largest clusters of offspring, indicating that the benefit of increased height was to increase the chances of colonising the surrounding environment.

### *Reference*

Emily G. Mitchell and Charlotte G. Kenchington. *‘The utility of height for the Ediacaran organisms of Mistaken Point.’* *Nature Ecology and Evolution* (2018). DOI: 10.1038/s41559-018-0591-6

See also: <http://www.cam.ac.uk/research/news/why-life-on-earth-first-got-big>

**Douglas Palmer, Sedgwick Museum**



## North West Highland Expedition

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Continued from page 1:

Our Geopark guide was Peter Harrison, who introduced us to the stunning scenery of the North West Highlands, from Ullapool to Cape Wrath and from Point of Stoer to Loch Eriboll, and to the geological events that created this landscape.

We marvelled at the sparkly million years old basement rock of Lewisian Gneiss, the oldest rock in Europe. Lying unconformable above the Lewisian were the pebbly brown Stoer Group sandstones, 2000 million years old, and barely distinguishable Torridonian sandstones deposited 1000 million years later. Deposited unconformably above the Torridonian are the basal Cambrian quartzites and the pretty pink and white Pipe Rock with lots of “Worm” burrows. The youngest rock was the Durness Limestone, deposited 480 million years ago and containing lots of stromatolites. And as if this were not enough, we saw various and dramatic intrusions. These were the black Scourian dykes cutting the Lewisian Gneiss, which in turn were cut by pegmatite veins and the whole lot faulted, making for very puzzling outcrops.

Our cups runneth over. We noted, we sketched, we photographed and some of us wielded our hammers. We discussed and we discoursed. Then there was more joy in the form of the Moine Rocks. These rocks are metamorphosed sandstones and mud deposited 980 million years ago, thought by the Victorian geological establishment to have been deposited on top of the Durness limestone and therefore younger, but proven by Peach and Horne in 1907 to have been older rocks thrust west over the younger rocks by mountain building 400 million years ago, when Scotland was part of a huge continental mass that included Greenland and north America. Then there was the cherry on the cake, evidence for the meteorite which struck at around 1.3 billion years ago. We could sense, the force, the heat, the drama and the utter destruction that must have been as we scrambled over the layer of ejecta in the late afternoon sunshine. It was a special delight to have with us, Gisela Poesges, who had organised and led us on our March 2017 visit to the much younger meteorite Ries craters in Southern Germany.



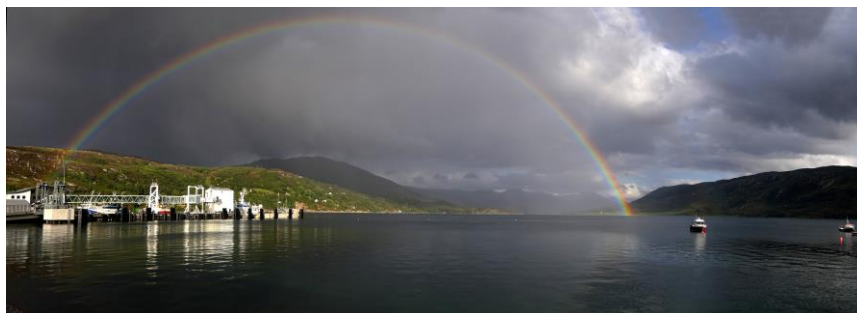
There was the marble quarry, limestone metamorphosed by the heat of an igneous intrusion, where the rain poured and the wind howled, and then we visited the fossil quarry and there was the thrill of finding the head of a trilobite preserved in the silty mudstone 500 million years ago.

Each evening we returned to our hotels tired but exhilarated, our rucksacks heavy with rock samples. But of course a Friends' trip is never about just the rocks. There is always more. There is the flora: the Marsh Orchid, the Eyebright, the fragrant Myrtle to deter the midges, and always a Friend with the expertise to extend our knowledge. Then there is the fauna: the shy red deer who gazed upon us from the mountain side, the elusive otter whose spoor we spotted leading to the depth of a cave in the Basal Quartzite. The skylarks wheeled over the moorlands, singing for all they were worth. Then there was the little wren at the glaciated gorge at Corrieshalloch, holding forth, his strident call echoing against the rocks.

One day we lunched - Tesco's Finest sandwiches, wraps and fruit pots - in a small cove of fine white sand formed by an unconformity of the Stoer Group. The oyster catchers on the rocks beneath, whooping us from their nests with raucous cries and posing intent. Another day we lunched at the site of two unconformities between Lewisian and Stoer Group and between the latter and the Torridonian Sandstone. We gazed seaward to the Summer Isles, shaped by glacial action a mere few thousand years ago, and scanned the calm sea for seals. Behind us were the glacially rounded hummocks of Lewisian referred to as whalebacks.

Then of course there were toilets, often sited on remote headlands and threatened with closure under a North West Highland economy drive, and the petitions we signed to save them in a nod to local politics and personal comfort. There were the coffee stops, the delicious cakes and pastries, and of course the highlight of the trip, the fascinating laser sand tray which we played with at the Rock Stop as we sipped yet another cup of delicious coffee.

Finally, there was the last supper: the traditional dinner for the Friends on the last night of a fieldtrip when we get together to say "lovely to see you" and "we'll meet again". It was also an opportunity to say thank you to our long suffering and all round lovely guide, Peter, who did so much to make the trip a success. The dinner was held in a stylish room on the second floor of the Atches pub which overlooked the moorings at Ullapool. We were afforded lovely views of the harbour and photo opportunities of a double rainbow on this rainy night. The food was good, the wine and the conversation flowed.



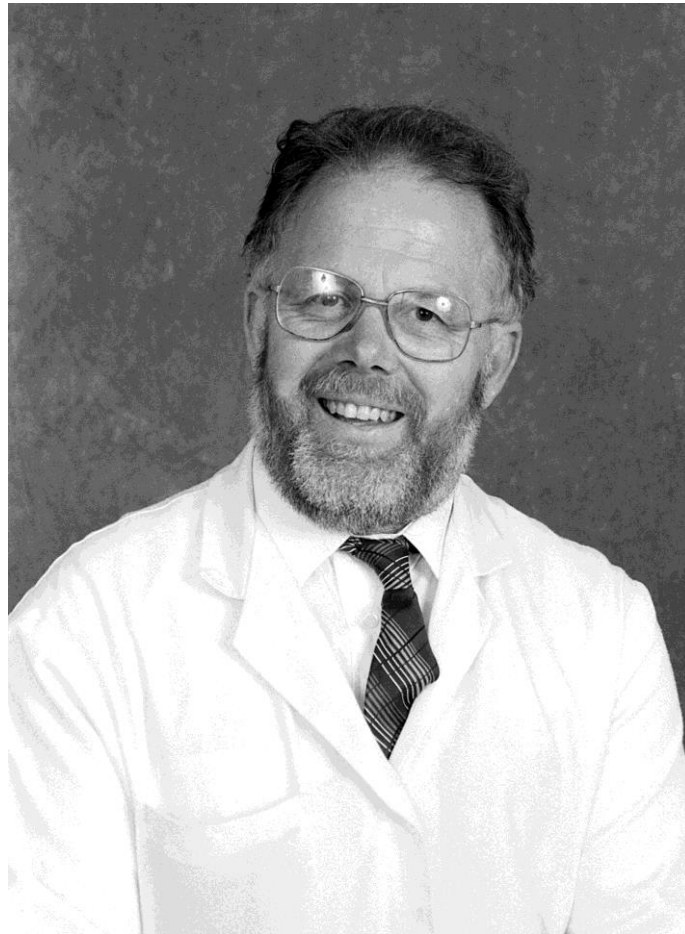
Then there were the final goodbyes and the journeys home, which are never straightforward with the intrepid Friends. Some of us were off to Shetland for a few days walking, another of us planned to walk the full length of the Hebrides (125 miles). And so it goes on. Next morning our delightful driver and part-time crofter, Gail arrived to drive some of us to the railway station in Inverness, and some of us to the airport. With a three-hour wait at the airport, Gail suggested a quick trip to the battlefield of Culloden and a visit to the ancient Clava Cairns. So off we went. The sun was shining; the breeze was soft. What better end to our trip?

**Jean Tuke**

Images: Torridonian Mountains and Rainbow over Loch Broom, ©Clive Pickton

## Roderic Long (1942-2018)

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Rod (Roderic) Long died in May 2018 at the age of 76. He was born in north Norfolk and brought up mainly by his grandmother, in the village of Burnham Market. After leaving school, he worked locally for a market gardener firm, as well as in various other village businesses. Employment was difficult to find in the area, and he eventually moved to Cambridge where he worked initially on the staff of the Fitzwilliam Museum, and then moved to the Sedgwick Museum of Geological Sciences.

In our Museum, Rod developed a remarkable knowledge of the names of fossils and rocks, and also of the history and personalities of their collectors and researchers. He was particularly skilled in sorting and packaging samples for dispatch in response to research requests to the Museum. He obviously enjoyed the Museum's treasures, and sharing this delight with the public. Before long he established himself as a major feature of the Museum's welcome to people visiting the Museum. Over the years Rod developed this reputation, fondly remembered by many visitors for his enthusiasm, as well as for his striking appearance in his white lab-coat and full white beard.

In retirement Rod became a keen member of the Cambridge branch of the Royal Aeronautical Society, perhaps harking back to his knowledge of the war-time airfields of his early life in Norfolk.

**Peter Friend and Ken Harvey, Friends of the Sedgwick Museum**

Image: ©Sedgwick Museum Archives

**Friends of the Sedgwick Museum  
BOOKING FORM**

<b>Date/Event</b>
<b>Contact details – please print</b>
<b>Name(s)</b>
<b>Email</b>
<b>Telephone</b>
<b>Address</b>
<b>Additional Information</b>  Parking required?  Special diet?

**Please enclose cheque for the appropriate amount made payable to  
‘The Friends of the Sedgwick Museum’  
and send to the person indicated on the programme**

**Enclosed cheque for \_\_\_\_\_**

**Signed \_\_\_\_\_**

**Details will be emailed to you unless you indicate otherwise**

Please rest assured that your data will be used solely by the Committee and its Officers for the management of the Friends' activities and will not be passed to any third parties unless you have given permission for this to happen. Your consent to receive matter by email can be withdrawn at any time.



## JOIN THE FRIENDS...

Membership is open to anyone!

## Contact details

The Friends of the Sedgwick Museum  
Downing Street  
Cambridge, CB2 3EQ

Department Reception:  
01223 333400

Email: [friendsofsedgwickmuseum@esc.cam.ac.uk](mailto:friendsofsedgwickmuseum@esc.cam.ac.uk)

## Key websites:

### SEDGWICK MUSEUM

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

### DEPARTMENT OF EARTH SCIENCES BLOG

<https://blog.esc.cam.ac.uk>

### CAMBRIDGESHIRE GEOLOGICAL SOCIETY

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

### FACEBOOK - SEDGWICK MUSEUM

<https://www.facebook.com/sedgwickmuseum>

## APPLICATION FORM

Please use block capitals and return the form, with your cheque, to the membership secretary.

Name (Dr, Mr, Mrs, Miss, Ms) *(delete as applicable)*

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Address.....

.....Postcode.....

Telephone.....

Email.....

Age (if under 18).....

### Subscriptions (please tick)

- Individual: £12 per annum (Over 18 years)
- Family: £18 per annum (Two or more members living at the same address)
- Young £6 per annum (Members under the person: age of 18)
- Concession: £8 per annum (Full time students, unemployed or over 60s)

*Membership is for one year and expires on 31<sup>st</sup> March. Members joining after 31<sup>st</sup> December will have the last quarter's membership included in the following year.*

- I attach a cheque for £..... made payable to The Friends of the Sedgwick Museum

Signed.....Date.....

**Gift Aid Scheme.** Because the Friends is a registered Charity (No. 1091393) we can claim an additional amount on any subscription or donation, provided that you are a UK tax payer. Your signature below will allow us to increase the value of each payment you make for the benefit of the Friends.

**Gift Aid Declaration.** I am a UK tax payer. I would like the Friends of the Sedgwick Museum to treat all membership fees and donations as Gift aid donations from the date of this declaration until I notify otherwise.

Signed.....Date.....

- Tick if you consent to the Friends contacting you by email to send you their Newsletter and keep you informed about their activities.

If you cease to be a member, in accordance with the Data Protection Act you may request us to erase all your contact information from our database by contacting [friendsofsedgwickmuseum@esc.cam.ac.uk](mailto:friendsofsedgwickmuseum@esc.cam.ac.uk)

Please rest assured that your data will be used solely by the Committee and its Officers for the management of the Friends' activities and will not be passed to any third parties unless you have given permission for this to happen. Your consent to receive matter by email can be withdrawn at any time.