



The Geological Society of London
Annual Review 2019
Solutions from Geology

"Antarctic Reflections" by Ingrid Demaerschalk, winner of the 2019 Earth Science Week Photo Competition



The
Geological
Society

-serving science, profession & society

Solutions from geology

From the president



Prof Nicholas Rogers

President: Prof Nicholas Rogers
Vice Presidents: Mr John Booth, Mr Nicholas Reynolds; Ms Jessica Smith; Mr John Talbot
Secretaries: Prof Katherine Royse; Prof Robin Strachan; Dr Alexander Whittaker Secretary, Foreign & External Affairs; Dr Sarah Gordon
Treasurer: Mr Graham Goffey

Mr Thomas Backhouse⁴;
Mr Andrew Bloodworth⁶; Mr John Booth^{1,6}; ~Dr Jason Canning⁴; *Dr Michael Daly^{1,3}; Ms Lesley Dunlop²; *Dr Joel Gill²; Mr Graham Goffey^{1,3}; *Dr Kathryn Goodenough⁵; Dr Sarah Gordon^{1,2,3}; Prof James Griffiths⁴; ~Dr Naomi Jordan²; Prof Chris King²; ~Dr Robert Larter²; *Mr Andrew Moore⁴; ~Dr Colin North^{1,3,5}; Prof Bryne Ngwenya⁶; ~Dr Sheila Peacock^{5,6}; Mr Nicholas Reynolds^{1,4}; Prof Nicholas Rogers¹; Prof Katherine Royse^{1,3,4}; *Mrs Sarah Scott⁴; ~Mr Keith Seymour^{1,4}; *Ms Gemma Sherwood²; Ms Jessica Smith^{1,4}; Dr Helen Smyth²; Prof Robin Strachan⁵; Mr John Talbot^{1,3,4}; Dr Alexander Whittaker^{1,2,6}

* New Council members elected at the AGM on 6 June 2019

~ Council members who retired at the AGM on 6 June 2019

Method of Election of Trustees

Trustees are elected by the Fellowship at the Annual General Meeting by ballot of Fellows present on a list of candidates. New trustees are annually invited to an induction day in order to obtain an understanding of the Society's affairs and what tasks they will undertake as a member of Council. They also receive written guidance on their responsibilities as trustees.

Audit Committee

The Audit Committee reports directly to Council. Members of the Audit Committee are: Mr Chris Bulley, Mr Roger Dunshea (Chair), Mr Nick Hardy, Mrs Beverley Parrish and Dr Nigel Platt.

As I write this message, the country is in the grips of the coronavirus pandemic. If anyone was in doubt that humanity faces challenges to our way of life, possibly our very existence, this event is yet another wake-up call to act. While geologists are not necessarily equipped to help in the defence against infection any more than other members of the public, we do have skills, knowledge and expertise of relevance to other challenges that society is currently facing. Hence the theme of this year's annual report: solutions from geology.

2019 was designated "The Year of Carbon", which started with the Bryan Lovell meeting on decarbonising the UK. This meeting explored all the ways that geologists will be critical in migrating to a low carbon economy and reducing CO₂ emissions. Geoscience knowledge and skills will be key to expanding our ability to generate and store energy from renewable sources, in carbon capture and sequestration and in the safe and efficient exploration and extraction of critical elements, essential components of batteries, wind turbines, and electric vehicles.

Climate change and our responses to it are not the only issues facing the Earth's growing population. Many of these challenges are summarised in the UN's Sustainable Development Goals (SDGs), and geologists will be key to meeting these challenges as well. The importance of the geosciences to ensuring global wellbeing was evident in our public lectures, with speakers offering insights into the disposal of radioactive waste and reducing risk associated with natural disasters, among other topics.

As we look toward how geologists will shape the future, it is clear that many of the skills that have served geologists for generations – such as 4-D thinking, interpreting irregular datasets, and a conceptual understanding of the subsurface, to name a few – will continue to be at the forefront. However, it is equally clear that there are other tools that geologists will need to embrace, for instance the application of big data analyses and numerical modelling techniques, and it is becoming increasingly important that geologists are able to communicate science, risk, and uncertainty to politicians and the public alike.

To ensure that future geologists are ready to meet the challenges ahead, we instituted a review of the Society's degree accreditation scheme and requirements. The review panel is bringing together leading professional and academic geologists to determine what skills, knowledge and behaviours geology bachelors and masters programmes will need to develop in their students.

In addition to our work with university geology departments, we have been able to increase our support to students and postgraduates through two new offerings. The ZEISS-GSL scholarship offers up to £8,000 for PhD projects involving a range of microscopic techniques. The Hazel Prichard Bursary, offered in memory of Hazel's contributions to economic and environmental geology, provides funding for field campaigns undertaken as part of a BSc or taught masters degree programme.

Sadly, the number of students applying to study geology at university has continued to decline in 2019. To counter this trend, the Society has ramped up its engagement with students and teachers in primary and secondary schools to show off everything that the science of geology has to offer. On a broader stage we have worked to ensure geology is more visible in society and culture. A new play, *She Sells Seashells*, produced by Scandal and Gallows, received some support from the Society, which enabled them to take their production to the Edinburgh Fringe. We also helped to sponsor the hit play *Dinomania* at the New Diorama Theatre, and we are confident that these initiatives, and more to come, will help inspire future generations of geologists.

To conclude, our science has never been in such a public spotlight. The ethical and political arguments surrounding hydrocarbons, the extractive industries in general and environmental impact are all very central to the professional and academic geoscientist. It behoves us when under such scrutiny to remember our professional standards and to stick to the science we understand. Sometimes we may feel uncomfortable with the answers science offers but it is essential that we remain true to that science and act as responsible ambassadors.

Rising to the challenge

From the Executive Secretary



Dr Richard Hughes

Last year I told you of the many changes occurring across the Society and the collective excitement we felt at the prospect of ensuring that GSL stands ready to serve the evolving needs of science, profession and society. In 2019 we began to see the green shoots emerging from these initiatives.

One of our key goals is to diversify the Society's revenue sources to mitigate against financial risks. Philanthropic fundraising and events were identified as priority areas for growth, and to that end the first meeting of the Society's Development Committee took place in late 2019. Chaired by past-president Malcolm Brown, the group will focus on securing income from philanthropic sources to support the Society's activities.

Our former Corporate Affiliates programme has been overhauled and re-launched as our Corporate Patrons Scheme, reflecting more accurately the Society's relationships with its corporate sponsors and the invaluable support they provide. A range of new benefits was introduced and our first Corporate Patron impact report produced. The Society receives no statutory funding and is reliant on the support of its Fellows, friends and corporate supporters to maintain and grow its activities. I would like to take this opportunity to express my sincere thanks to all our corporate patrons.

In late 2019 I was delighted to appoint a new Head of Events, who is working hard to improve our venue hire services and embed a commercial approach, whilst ensuring the Society continues to deliver high quality conferences and meetings in accordance with the Science Strategy. You may have already noticed a fresh look to venue hire section of the website, and will soon see changes in our events listing and marketing materials.

Of course, our Fellows and friends remain at the heart of the Society. As our profession changes, so too do the needs of our members. A review of our membership categories and benefits has therefore been initiated to ensure they meet the needs of current and potential fellows. I thank all those academics and early career professionals who responded to our surveys to inform this review.

Guidance around Chartership and CPD recording has been improved, and chartership staff continue to introduce students and early career researchers to the process around the UK and internationally. In early 2019 I had the pleasure of visiting our Hong Kong Regional

Group and saw first-hand the value of professional accreditation there. I also used this opportunity for a short detour to Kuala Lumpur where I spoke with key local officials about the benefits of chartership and degree accreditation. The Early Career Network has followed its 2018 launch with a number of networking and CPD events around the UK, and I encourage everyone new in their career to take part in these.

Geologists entering employment at this time will undoubtedly see changes in the way they work, and in the types of problems to which they will need to apply their skills. During the Year of Carbon, it was made clear that geoscientists will be at the heart of efforts to meet net zero emissions targets. Geologists will be called upon to address a number of challenges, including the more efficient recovery of oil and gas as part of the energy transition, the effective storage and sequestration of carbon released during energy production, and bringing other forms of energy like geothermal onstream quickly and safely.

The energy transition will also require a step change in the mining of the critical elements required to support batteries, wind turbines, and electric vehicles. The Society has taken the lead on discussions around responsible use of natural resources, and responsible investing in companies that tap into these resources, which was evident at the *Responsible Investing in Natural Resources* meeting in October. The Geological Society Business Forum, an evolution of the former City of London Geoscience Forum, will ensure that these questions are kept at the forefront of discussions in the legal and investment communities.

At the time of writing the unprecedented coronavirus pandemic is beginning to impact very significantly upon all our lives. The months ahead are very uncertain but I remain hopeful and optimistic that the Society will continue to provide a community for all geoscience professionals to meet the challenges of our times.

A handwritten signature in black ink that reads "Richard Hughes". The signature is fluid and cursive, with a long horizontal stroke at the end.

The importance of geology

In 2019, the Society marked the 100th anniversary of the admission of female Fellows and explored the geoscience of carbon with a range of activities that engaged students, scientists and the general public

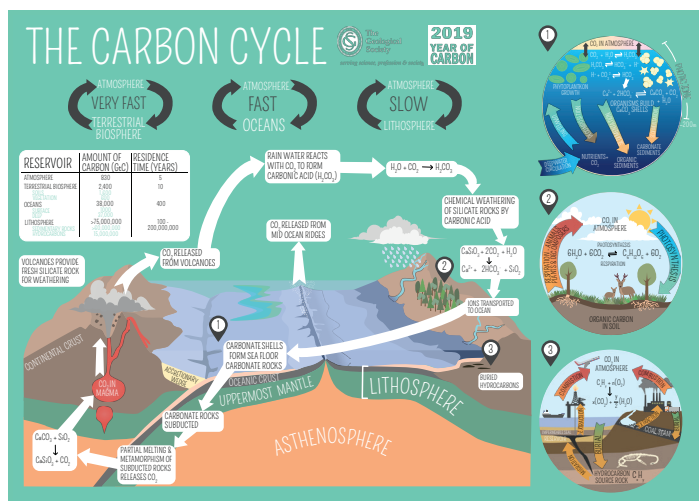
As governments work to meet net zero targets and build infrastructure for a growing population, the importance of the work of geologists has been thrown into increasing relief. From obtaining critical metals with minimal environmental impact to building resilience to natural hazards, geoscientists will be at the forefront of helping to meet the UN's Sustainable Development Goals and ensuring the wellbeing of people and the environment. In 2019, the Society explored and promoted the importance of geoscience, whilst providing a community and platform from which to advance the science and profession.

Conference on *Carbon: From ancient storage to future challenges*. The meeting addressed three themes – carbon storage in Earth's past, carbon capture and storage, and carbon storage in marine sedimentary environments – through a variety of keynote speeches, talks and posters.

On a more artistic note, the Library ran two carboniferous drawing classes in April and May. Attendees had a unique opportunity to draw carboniferous fossils on loan from the Natural History Museum and the British Geological Survey, plus one fossil from our former museum collection.

One of the first of the Publishing House's new thematic collections focused on *Carbon forms: paths and processes in the Earth*. This collection of papers, published in the *Journal of the Geological Society*, explores how carbon moves and is transformed in the solid Earth. 2019 also marked the 25th anniversary of the journal *Petroleum Geoscience*. This milestone was celebrated with the launch of a new section on energy geoscience, which publishes novel research into non-petroleum aspects of geo-energy and applied Earth science.

The education team designed another successful set of resources for students, teachers and general enthusiasts, with the carbon cycle poster a particular success on social media. The infographics also included information on how humans have impacted the carbon cycle, and the link between climate and carbon.



YEAR OF CARBON

As the fourth of the Society's themed years, the Year of Carbon explored the intersection of the Earth and the carbon cycle, including human influences such as fossil fuel extraction and use. Throughout the year, Burlington House played host to a number of conferences and lectures on various aspects of carbon and, of course, ways to reduce carbon emissions. The year began with the Bryan Lovell Meeting on *The role of geological science in the decarbonisation of power production, heat, transport and industry*. The meeting brought together representatives from industry, statutory bodies and research to discuss the role geoscience will play in the path to net zero emissions. It resulted in a briefing note and spurred a blog series.

The Janet Watson Meeting was held in conjunction with the Deep Carbon Observatory, and also played host to a special lecture by Bob Hazen. Four additional public lectures were held on the theme of carbon, including a special lecture co-hosted with the Royal Society of Chemistry, which featured Ros Rickaby speaking on the role of ocean chemistry in the evolution of photosynthesis. This lecture served as a joint celebration of Earth Science Week and the 150th anniversary of the periodic table.

Also on the programme was the Petroleum Group's *Petroleum Geology of Mexico and the Northern Caribbean* conference. This meeting welcomed speakers from the Americas as well as the UK and Europe, and will be forming the basis of a Special Publication. In September, the Marine Studies Group hosted the Shackleton

STRENGTHENING THE PROFESSION

The Society was pleased to mark the 100th anniversary of the admission of female Fellows on 21 May 2019. In addition to looking at the contributions of the first women to join the Society through a Library exhibition and a blog series, we also explored the current state of diversity in the geosciences and what is needed to support and grow diversity in universities and the profession. The programme began with a panel discussion on *Female in the Field: Challenges and Opportunities*. Although focused on the female experience, the discussion highlighted a number of practices that can increase everyone's confidence in learning and working in the field.

We have also developed a comprehensive resource on diversity in the geosciences, which covers widening participation, gender, race and ethnicity, accessibility, and education. The online compilation also contains a useful resources for promoting mental health awareness and support both in the field and out. You will also find that all GSL events are now covered by a code of conduct, with a clear reporting structure for any breaches.

2019 also saw the launch of a number of new opportunities and resources for students and early career professionals and researchers. Two new funding opportunities, the ZEISS-GSL scholarship and the Hazel Prichard bursary, offer funding for PhD and BSc/Masters students respectively. Our Career and Industry Days, which offer students the opportunity to speak to geoscientists working in a variety of industries and job roles -



and to meet with potential employers - are now held in three locations: Nottingham, Edinburgh and London.

For those relatively new in their careers, the Early Career Network offered a number of networking and training events around the UK, whilst the Chartership team launched an online mentoring site on LinkedIn for those preparing to apply for CGeol and CSci status. GSL also continued to offer the Early Career Award, with heats held across the UK and the final held in Burlington House in March. We also sent six young geoscientists to Westminster to take part in the Voice of the Future event, which allows students and postgraduates to attend Parliament and question MPs and ministers about the future of science in the UK.

Much of the policy team's additional work focused on the repercussions of Brexit. For instance, the team coordinated a response to the Government's call for evidence on the immigration policy white paper, with a particular focus on the impacts of the proposed salary threshold on technicians. The Society also took part in a roundtable with Adrian Smith as part of his review on the future of international research collaborations.

A COMMUNITY FOR GEOLOGISTS

The Society continued to grow the number of in-person and online options for geoscientists to exchange knowledge and ideas. The Publishing House saw the release of several milestone publications, including the 50th Memoir, entitled *Sweden: lithotectonic framework, tectonic evolution and mineral resources*, and the 500th Special Publication, on *Subaqueous mass movements and their consequences: advances in process understanding, monitoring and hazard assessments*. Articles across all of the book and journal series were also seen by an increasing number of people, with a 17% growth of new Lyell Collection users.

The Library continued to ensure that Fellows and other users have access to a growing range of books, maps and journals. From November, the Society's librarians began offering drop-in lunchtime sessions on the last Thursday of the month. These sessions are targeted at Fellows who are either unfamiliar with the Library and its collections and services, or in need of a refresher.

Between the drop-ins and other users, the Library hosted just over 3,000 visitors across the year. Online, there are now over 2,600 registered users accessing journals via Athens. In May, the Library joined the Library Hub, a database of 195 UK and Irish academic, national and specialist library catalogues, making our books, journals and maps more discoverable for

students, researchers, academics and librarians around the world.

The Society hosted the inaugural event of the Environment Network, which aims to provide a community for geoscientists interested in all areas of environmental geology. The networking evening provided an introduction to the activities of the numerous relevant specialist groups, and culminated in a talk by Iain Stewart on the importance of science communication. The Network has now launched a LinkedIn page for further virtual discussions.

BUILDING AWARENESS

The Society engaged in a range of activities to raise awareness of the importance of geology. The National Schools Geology Challenge, which invites teams from schools across the country to compete via poster and oral presentations, saw an increasing number of participants in the regional heats, with 11 teams reaching the finals at Burlington House. We also ran a number of workshops on plate tectonics for year 7 to 9 students in the Lower Library, where our tectonics floor map made routine appearances.

The education team also ventured out to meet students and their families at schools and festivals. In London, they led activities at Big Bang Near Me events in Kings Cross and Newham, the Primary Careers Conference in St Pancras, the Royal Institution Family Fun Day and the Geologist's Association Festival of Geology. You may have also encountered us at the Yorkshire Fossil Festival in Scarborough and the Lyme Regis Fossil Festival.

The Society also expanded its range of training options for teachers, holding the first Geoscience Education Academy for primary school teachers in collaboration with the Primary Science Teaching Trust, alongside our traditional event for secondary teachers in the summer. We also teamed up with the Linnean Society and Artsmark to offer a one-day workshop for 20 art teachers, training them in geologic concepts and how these concepts can be taught through art.

And, to share the importance of geoscience with the broader public, we again led Earth Science Week, this year with the theme "Geoscience is for everyone". At least 40 events took place across the UK and Republic of Ireland, with a few funded by small grants from the Society. This year, the photo competition was expanded to include great geology from around the world. We received a range of photographs, with the winner photograph (pictured on our cover) taken in Antarctica.

A mixed year

From the Treasurer



Graham Goffey

2019 was a mixed year for the Society from a financial perspective, with recovery in value of the Society's investment portfolio offset by disappointing underperformance or flat-lining in respect of income from the Society's main income sources. On the positive side, the Society's investment portfolio recovered its value and this significant unrealised gain, partially offset by unrealised foreign exchange losses, led to a modest overall increase in funds of £0.13m, partially reversing 2018's £0.65m decrease.

Income was £5.5m (2018 £5.8m) and expenditure and charges of £6.08m were broadly in line with 2018 (£6.18m), with inflationary rises in some areas largely off-setting cost savings in other areas. A 2018 drop in income from conference activities continued in 2019 along with reduced income from room lettings. Steps are being taken to rejuvenate the conference pipeline, broaden the appeal of the Society's flagship meetings and improve our lettings offer. Once fully implemented, these should bear fruit once COVID-19 is behind us. Fellowship numbers also fell in 2019 to 11,952 (2018: 12,382). Whilst not a precipitous fall, Fellowship fees are of course a major source of the Society's income. For some years Council has limited increases in Fellowship fees in line with Consumer Price Inflation and in 2019 this modest increase was broadly comparable to the income lost through reduced Fellowship numbers. A review of the Fellowship fees structure is underway with a view to a simplification in 2022 accompanied by clearer marketing of the many benefits of Fellowship.

Publishing House revenues were also reduced. The Lyell collection continues to hold up well and the future new book pipeline looks healthy. However 2019 book sales income in particular was impacted by a decline in the US hard copy book market, exacerbated by issues with the Society's web sales software. Neal Marriot has now retired from his longstanding leadership of the Publishing House. Neal has been a fantastic servant of the Society for the last 18 years, during which period the Publishing House has been highly successful. Happily Maggie Simmons has been promoted from within the organisation as his replacement.

In respect of Burlington House, our engagement with the landlord, the Department of Housing, Communities and

Local Government, continued in 2019.

Despite initial encouragement, our hopes for a long term solution to ensure affordable tenure were unfortunately not met. However the Courtyard Societies were finally presented with and entered into renewed leases for the next 10 year period. Rent levels continue to rise extremely rapidly; whilst entitled to continued lease renewals, as currently structured escalating rental levels will soon be unaffordable for almost all of the Courtyard Societies. However we are seeking to explore alternative solutions with our landlord. If no solution can be found, Fellows should expect the Society to have to leave Burlington House within 3-5 years. In such circumstances, we will all need to view such a move in positive terms as an opportunity and not depart our home of almost 150 years with overly heavy hearts.

With the uncertain lease trajectory meaning there is potential for appreciable cost exposure should the Society need to leave Burlington House and re-establish itself in new premises, it is critical that the Society preserves its financial resources, in particular its free reserves. Budgeted expenditure in 2020 is lower than 2019 actual expenditure, whilst budgeted income is slightly higher, predicated mainly on an uptick in publishing income. This budget of course pre-dates the COVID-19 pandemic and, as I write in late March 2020, the impact of the pandemic means that many of the Society's events and room lettings have been cancelled or deferred. Substantial falls in global stock markets have also detrimentally impacted the value of the Society's investment portfolio. Clearly 2020 will be a challenging year for us all and for the Society, both financially and in many other respects.

Whilst staff will be working hard to maintain normal services as far as possible, Fellows should expect to see a degree of belt-tightening, some re-evaluation and perhaps re-prioritisation of our activities with a strong drive to rejuvenate income as and when COVID-19 lifts. I am grateful for all of the efforts of our staff and volunteers in these challenging times and greatly appreciate Fellows continued loyalty and commitment to this venerable Society.

A handwritten signature in blue ink, appearing to be 'GG', written in a cursive style.

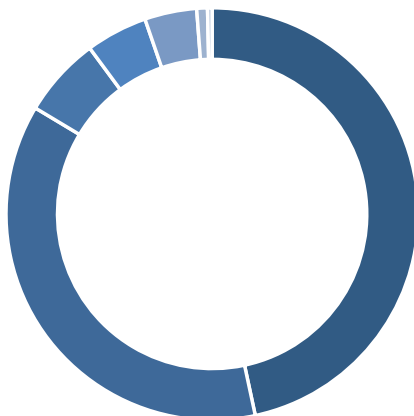
[Please note that financial data in this report is based on preliminary accounts and may differ slightly in the final audited accounts].

Society finances 2019

Income sources 2019

Income source (in £000s)

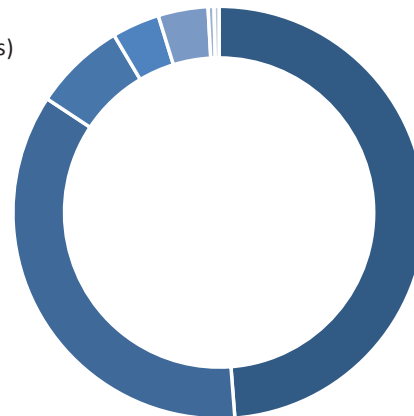
- Publishing (£2604)
- Membership (£2063)
- Events (£351)
- Trading (£270)
- Investments (£228)
- Donations (£47)
- Library (£20)



Income sources 2018

Income source (in £000s)

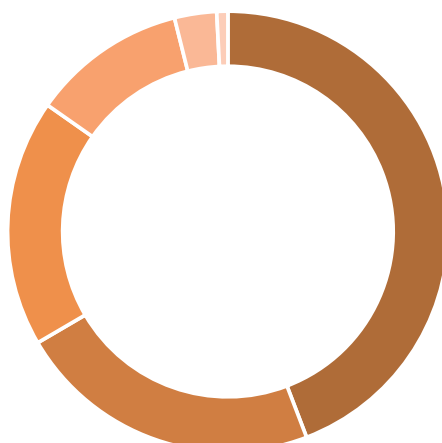
- Publishing (£2842)
- Membership (£2069)
- Events (£419)
- Trading (£218)
- Investments (£228)
- Donations (£27)
- Library (£23)



Expenditure 2019

Expenditure (in £000s)

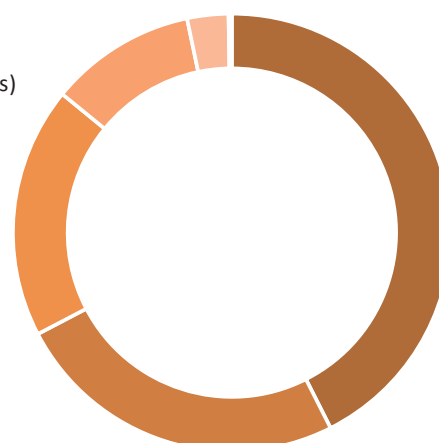
- Publishing (£2717)
- Science (£1377)
- Library (£1116)
- Professional (£699)
- Trading (£190)
- Investments (£50)



Expenditure 2018

Expenditure (in £000s)

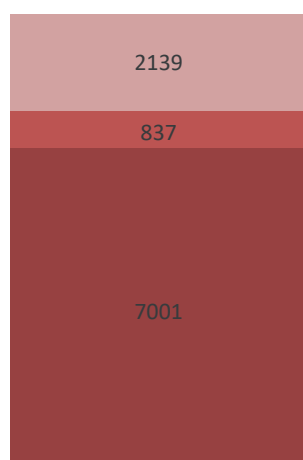
- Publishing (£2629)
- Science (£1531)
- Library (£1147)
- Professional (£668)
- Trading (£188)
- Investments (£15)



Funds 2019

Funds (in £000s)

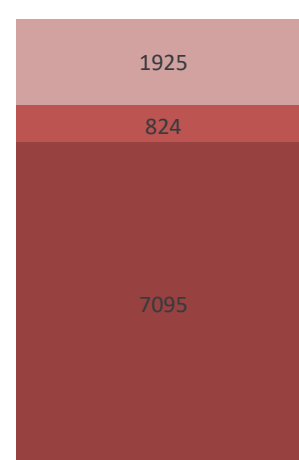
- Endowment (£2139)
- Restricted (£837)
- Unrestricted (£7001)



Funds 2018

Funds (in £000s)

- Endowment (£1925)
- Restricted (£824)
- Unrestricted (£7095)



Please note that the 2019 figures are unaudited and may be subject to amendment.

PLATINUM PARTNERS



GOLD PARTNERS

ATKINS



ExxonMobil



RioTinto



Schlumberger

SILVER PARTNERS



ConocoPhillips



BRONZE PARTNERS

Anadarko Petroleum Corporation (UK)
Anglo American
Blue Water Energy
C & C Reservoirs Ltd
Cardinal Resources
Condor Gold
Cornish Lithium
CGG
CNOOC Ltd
ENI UK Ltd

ERC Equipoise Ltd
Fasken Martineau LLP
Getech
Hogan Lovells
Ikon Science Ltd
INEOS Upstream Ltd
Norton Rose Fulbright
Pensana Metals
PGS Exploration Ltd
Premier Oil

Reabold Resources
RPS Energy
Sasol
Scotgold Resources Limited
Siccar Point Energy
TerraFirma IDC
Tellurian Inc.
Wood Mackenzie
Vinson & Elkins LLP

If your organisation would like to find out more about the benefits of becoming a Patron, please contact Jenny.Boland@geolsoc.org.uk.

In addition to the companies listed above, the Society wishes to offer its sincere thanks to all the companies, universities, and other organisations that allowed their staff the time and resources to participate in voluntary Society activities.