

Trustees' report and financial statements

For the year ended 31 March 2017

Trustees

The Trustees of the Society are the members of its Council, who are elected by and from the Fellowship. Council is chaired by the President of the Society. During 2016/17, the members of Council were as follows:

President

Sir Venki Ramakrishnan

Treasurer

Professor Anthony Cheetham

Physical Secretary

Professor Alexander Halliday

Foreign Secretary

Professor Richard Catlow**

Sir Martyn Poliakoff*

Biological Secretary

Sir John Skehel

Members of Council

Professor Gillian Bates**

Professor Jean Beggs**

Professor Andrea Brand*

Sir Keith Burnett

Professor Eleanor Campbell**

Professor Michael Cates*

Professor George Efstathiou

Professor Brian Foster

Professor Russell Foster**

Professor Uta Frith

Professor Joanna Haigh

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Dr Hermann Hauser

Professor Angela McLean*

Dame Georgina Mace*

Dame Bridget Ogilvie**

Dame Carol Robinson**

Dame Nancy Rothwell*

Professor Stephen Sparks

Professor Ian Stewart

Dame Janet Thornton

Professor Cheryll Tickle

Sir Richard Treisman

Professor Simon White

* Retired 30 November 2016

** appointed 30 November 2016

Executive Director

Dr Julie Maxton

Key Management Personnel

Jennifer Cormack, Director of Development

Dr Claire Craig, Director of Science Policy

Mary Daly, Chief Financial Officer

Bill Hartnett, Director of Communications

Dr Paul McDonald, Director of Grants Programmes

Lesley Miles, Chief Strategy Officer

Dr Stuart Taylor, Director of Publishing

Dr David Walker, Executive Assistant to the Executive Director and Governance Officer

Rapela Zaman, Director of International Affairs

Statutory Auditor

BDO LLP

2 City Place

Beehive Ring Road

Gatwick

West Sussex

RH6 0PA

Bankers

The Royal Bank of Scotland

1 Princes Street

London

EC2R 8BP

Investment Managers

Rathbone Brothers PLC

1 Curzon Street

London

W1J 5FB

Internal Auditors

PricewaterhouseCoopers LLP

Cornwall Court

19 Cornwall Street

Birmingham

B3 2DT

Registered Charity Number 207043**Registered address**

6 – 9 Carlton House Terrace

London SW1Y 5AG

royalsociety.org

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President's foreword

This has been a year of major upheaval in the UK with our decision to leave the European Union. The Royal Society published a series of reports on the impact of the EU on UK science ahead of the referendum, and it is fair to say that for most scientists the evidence of benefit was quite clear. However, many factors influenced the vote and with the decision taken the onus has fallen on ensuring that UK science continues to flourish.

Within days of the vote I was speaking at an event in Parliament outlining the three key areas that needed to be addressed in the negotiations – mobility of and collaboration between scientists across borders; funding; and a regulatory environment that supports research and innovation. We continue to make that case and it is worth noting that Theresa May identified making the UK the best place for science and innovation as one of the Government's 12 priorities for Brexit.

Against the backdrop of Brexit the importance of science and innovation to the nation's general and economic welfare has risen high on the political agenda. The Royal Society has been working with others to make this case and in the Autumn Statement the Chancellor committed an additional £4.7 billion of investment in research over the next four years.

Science, research and innovation were also made the first pillar of the Government's Industrial Strategy green paper, published in January. Mirroring the views of the Royal Society, the green paper also highlighted the importance of skills and investment in infrastructure in delivering increasing productivity and driving growth across the country.

The year has also seen the passage of the Higher Education and Research Bill through Parliament. The Royal Society engaged constructively in scrutiny of these proposals to ensure that they were informed by evidence and did not jeopardise the many outstanding elements of the existing research system. I believe that the establishment of UK Research and Innovation will provide a strong and unified voice for science that can help tackle the considerable national and global challenges that lie ahead.

Tackling those challenges is what science is all about and, as the national academy of science in the UK, I am delighted that the contributions of our Fellows were recognised by the Nobel Prize committee. I want to offer my personal congratulations to Sir J Fraser Stoddart FRS who was awarded the Nobel Prize in Chemistry, and Professor Frederick Duncan M Haldane FRS and Professor David J Thouless FRS who were awarded the Nobel Prize for Physics.



Venki Ramakrishnan
President of the Royal Society

Executive Director's report

It is important that scientists engage with different groups in society and with the public in general to find out about their experiences, listen to their views and to make science part of a wider conversation. This year has seen a step change in the way the Royal Society engages with the public in our policy work.

We launched our *GM plants: Questions and answers* project, where we commissioned Ipsos MORI to find out what people want to know about GM plants, and then drew on a panel of expert, independent scientists to respond. We also talked with the public about machine learning, through questionnaires and dialogue workshops, an online community and a series of sold-out public events. The results of this work, the first evidence about the UK public's views on machine learning, was published with our report *Machine learning: the power and promise of computers that learn* in April. The report probes important issues around machine learning and assesses the opportunities and challenges this technology presents. It was published at a critical time in the development and use of the technology, and the accompanying debate about how it will reshape the UK economy and affect people's lives.

Science is an inherently international activity. The Society is committed to working with partners to address global issues and challenges and as part of the Global Challenges Research Fund (GCRF), we have launched a new grants programme: Royal Society Challenge Grants. Working with our delivery partners, including the other national academies and Research Councils UK, we are addressing the global challenges directly relevant to developing countries. We are funding exceptional research programmes, promoting collaborative research in support of socio-economic development, using the strengths of the UK research base to build research capacity in developing countries and training research leaders in those countries.

In July 2016 we joined national academies across the UK and Europe in issuing a joint statement about the importance of the international nature of research. Alongside the statement, we launched a social media campaign under the hashtag *#ScienceIsGlobal*, which quickly reached 9.5 million people, with over 12,000 retweets and mentions from all over the world.

One of the Society's strengths is instigating collaborative projects to ensure that science and scientific evidence is considered broadly. Our *Science and the law* programme brings together scientists and members of the judiciary to ensure the best scientific guidance is available to the courts. The programme of seminars and meetings with senior judges has included events on memory, uncertainty and probability, mental capacity and pain, and future events include machine learning, substance addiction, human gene editing, robotics and causation. We are also working alongside the Judicial College, the Lord Chief Justice, the Lord President of Scotland and the Royal Society of Edinburgh to develop a series of easily understood guides or 'primers' on scientific topics designed to assist the judiciary when handling scientific evidence in the courtroom.

In October, I was delighted when we awarded the inaugural Royal Society Athena Prize to the London Mathematical Society in recognition of their advancement of diversity in science, technology, engineering and mathematics within the mathematical community. The Athena Prize was presented at our annual Diversity Conference, which explored how we can create and maintain inclusive environments within science to maximise innovation and creativity as well as career progression for all.



Dr Julie Maxton
Executive Director of the Royal Society

The Royal Society

The Royal Society of London for Improving Natural Knowledge, commonly known as The Royal Society, is a self-governing Fellowship of many of the world's most distinguished scientists drawn from all areas of science, technology, engineering, mathematics and medicine. It is the science academy of the UK and of the Commonwealth. The Society's fundamental purpose, reflected in its founding Charters of the 1660s, is to recognise, promote and support excellence in science and to encourage the development and use of science for the benefit of humanity.

Fellows are elected through a peer-review process on the basis of excellence. At 31 March 2017 there were 1441 Fellows and a further 166 Foreign Members, including 76 Nobel Laureates. It is from the eminence of its Fellowship and Foreign Membership and its independence from government that the Society derives its authority in scientific matters. Fellows and Foreign Members fulfil a range of responsibilities for the Society on a voluntary basis. Many others, scientists and non-scientists, also contribute to the work of the Society on a voluntary basis. The Fellowship is supported by staff based in London.

The six strategic priorities detailed in the Society's Strategic Plan 2012 – 2017 are:

- Promoting science and its benefits
- Recognising excellence in science
- Supporting outstanding science
- Providing scientific advice for policy
- Fostering international and global cooperation
- Education and public engagement

The Society undertakes a very broad range of activities that provide public benefit either directly or indirectly. The Society is concerned with excellent science wherever and by whomever it is done and is committed to increasing diversity in science.

New strategy

As our current strategy comes to an end in 2017, a new Strategic Plan 2017 – 2022 will form the core focus of the Society's activities over the next five years. This builds on the work undertaken to date and reflects the changing scientific, political and social developments during the past five years, including the UK's decision to leave the European Union. Since its formation, the Royal Society has played a key role in promoting science and the value of science around the world and this plan recognises that this role is as important now as it has ever been.

The Society's strategic priorities emphasise its commitment to the highest quality science, to curiosity-driven research, and to the development and use of science for the benefit of society.

These priorities are:

- Promoting excellence in science
- Supporting international scientific collaboration
- Demonstrating the importance of science to everyone

Promoting science and its benefits

Outstanding science, technology and innovation are essential to improving health and well-being and advancing our cultural, social and economic lives. Working across the full spectrum of scientific disciplines, the Royal Society supports scientists working in industry and academia to encourage the development and use of science for the benefit of humanity.

Breakthrough science and technologies: transforming our future

The increasing importance of the knowledge-driven economy means that the flow of ideas and skills between the research base, industry, business and the wider community is crucial to future prosperity.

As a key component of our Science and Industry programme, we have established a series of unique, high-level events at the Society to address the major scientific and technical challenges of the next decade.

We held two major *Transforming our future* events in 2016/17 – *From satellite to soil: connecting environmental observation to agri-tech innovations* and *Synthetic biology – does industry get it?* The talks and discussion have outlined the opportunities offered by these new technologies and the challenges faced in translating research advances into industrial applications, such as funding, regulation and skills. These conferences provide a unique opportunity for scientists working in industry to engage with colleagues in academia with the aim of fostering closer collaboration between the sectors for the common good.

“[This meeting] succeeded in bringing together both academic and industrial people in an informal atmosphere... it will help build working relationships.”

Anonymous feedback to the synthetic biology meeting

Future conferences for 2017/18 are being planned on the topics of genome editing, energy storage and the internet of things.

Royal Society Innovation Awards

The Royal Society Innovation Awards launched in May 2016 to support entrepreneurial researchers to take their research from the lab to begin the process of commercialisation.

Professors Chris Phillips and Rebecca Fitzgerald's collaboration on the diagnosis of Barrett's Oesophagus was recognised with a Royal Society Innovation Award of £247k during the year for developing a method for early non-invasive detection of oesophageal cancer. Oesophageal cancer has a mortality rate of 80% at five years. If the pre-cancerous condition Barrett's Oesophagus is detected early it can be monitored and treated before the cancer develops. However, existing cancer diagnostics rely on examination and grading by a specialist histopathologist. The Phillips laboratory have developed 'Digistain' which computes a 'nuclear-to-cytoplasmic ratio' (NCR), an indicator of the extra DNA copies and nuclear size and shape disruption accumulated during the rapid cell division at the onset of cancer.

This is a reproducible, quantitative and objective method and is therefore expected to be more reliable for the early detection of cancer. The Fitzgerald laboratory has developed 'Cytosponge', a pill containing a compressed sponge attached to a string which expands in the stomach, collecting a sample of cells from the oesophagus lining when pulled back up.

Combining these two technologies provides a cost-effective, accurate and objective screen for Barrett's Oesophagus.

"This award is invaluable for helping us in crossing the 'valley of death'. Firstly, the freedom that we can spend it makes it a really effective lubricant in a complex enterprise like this that involves many parties; secondly that fact that constitutes the imprimatur of some of the nation's best scientific entrepreneurs really impresses investors."

**Professor Chris Phillips, Imperial College, London.
Royal Society Innovation Award winner in collaboration
with Professor Rebecca Fitzgerald, MRC Cancer Unit,
University of Cambridge.**

In March 2017, we held our annual *Labs to riches* event, promoting collaboration and translation by bringing together leading scientists and industrialists.

Recognising excellence in science

The Society recognises the excellence and creativity of scientists by election to the Fellowship and Foreign Membership and gives awards to those scientists who are making a major contribution to society.

New Fellows

Fifty new Fellows, ten new Foreign Members and one new Honorary Fellow were elected to the Society in April 2016, of which fifteen were women. New Fellows were admitted in July 2016 at the Admissions Ceremony, during which they signed the Charter Book.

New Fellows 2016

Professor Christopher Abell FMedSci FRS
 Professor Jas Pal Badyal FRS
 Professor Steven Balbus FRS
 Professor Polina Bayvel CBE FREng FRS
 Professor Graham Bell FRS
 Professor Martin Bridson FRS
 Professor John Burrows FRS
 Professor Katharine Cashman FRS
 Professor Sarah Cleaveland OBE FRS
 Mr James Collier FRS
 Professor Alastair Compston CBE FMedSci FRS
 Professor Brian Cox OBE FRS
 Professor Jack Cuzick CBE FMedSci FRS
 Professor William David FRS
 Professor Christl Donnelly FMedSci FRS
 Professor Marcus du Sautoy OBE FRS
 Professor James Dunlop FRS
 Professor Artur Ekert FRS
 Professor Maria Fitzgerald FMedSci FRS
 Professor Pratibha Gai FREng FRS
 Professor Antony Galione FMedSci FRS
 Professor Harry Gilbert FMedSci FRS
 Professor Patrick Gill MBE FRS
 Professor Dame Anne Glover DBE FRS
 Professor Neil Gow FMedSci FRS
 Professor Ian Graham FRS
 Professor Richard Harvey FRS
 Professor Adrian Hayday FMedSci FRS
 Dr Ramanujan Hegde FRS

Dr David Hight FREng FRS
 Dame Sue Ion DBE FREng FRS
 Professor Eugenia Kumacheva FRS
 Professor Corinne Le Quéré FRS
 Professor Mark Lemmon FRS
 Dr David Lodge FMedSci FRS
 Professor Eleanor Maguire FMedSci FRS
 Professor Lakshminarayanan Mahadevan FRS
 Professor Gilean McVean FMedSci FRS
 Professor Russell Morris FRS
 Professor Luke O'Neill FRS
 Professor Simon Peyton Jones FRS
 Dr Jonathon Pines FRS
 Professor James Prosser OBE FRS
 Professor Sriram Ramaswamy FRS
 Professor Caroline Series FRS
 Professor Theodore Shepherd FRS
 Professor Alison Smith OBE FRS
 Professor David Wales FRS
 Professor Philip Withers FRS
 Professor Paul Workman FMedSci FRS

New Foreign Members 2016

Professor Robert Cava ForMemRS
 Dr Vint Cerf ForMemRS
 Professor Mark Davis ForMemRS
 Professor Jennifer Doudna ForMemRS
 Professor Gerd Faltings ForMemRS
 Dr John Hayes ForMemRS
 Professor Svante Pääbo ForMemRS
 Professor Pasko Rakic ForMemRS
 Dr Rino Rappuoli ForMemRS
 Professor Ellen Williams ForMemRS

New Honorary Fellow 2016

Lord Adair Turner FRS

Medals and awards 2016/17

The Society's medals, awards and prize lectures provide a mechanism for the recognition and celebration of excellence within all aspects of science. The public recognition of leading scientists serves to inspire others to continue the advancement of science.

Copley Medal

Dr Richard Henderson FRS

Royal Medals

Sir John Meurig Thomas FRS

Professor Elizabeth Robertson FRS

Professor John Goodby FRS

Croonian Medal and Lecture

Professor Jonathan Ashmore FRS

Bakerian Medal and Lecture

Professor Andy Hopper CBE FRS

Rumford Medal

Professor Ortwin Hess

Davy Medal

Professor Stephen Mann FRS

Darwin Medal

Dame Caroline Dean OBE FRS

Sylvester Medal

Professor Timothy Gowers FRS

Leverhulme Medal

Professor Anne Neville

Ferrier Medal

Professor Christine Holt FMedSci FRS

Michael Faraday Medal and Lecture

Dr Nick Lane

Rosalind Franklin Award and Lecture

Professor Jo Dunkley

Francis Crick Medal and Lecture

Professor Simon Myers

Wilkins-Bernal-Medawar Medal and Lecture

Professor Jon Agar

Kavli Education Medal and Lecture

Dr Becky Parker

Kavli Medal and Lecture

Professor Henry Snaith FRS

Milner Medal and Lecture

Professor Andrew Zisserman FRS

Mullard Award

Jointly awarded to Professor Steve Furber CBE FREng FRS and Ms Sophie Wilson FREng FRS

Armourers & Brasiers Company Prize

Professor Neil Alford MBE FREng

Pfizer Award

Dr Amina Abubakar Ali

Copley Medal

Dr Richard Henderson FRS was awarded the Copley Medal, the world's oldest scientific prize, for his work on imaging techniques which have enabled scientists to understand the arrangements of atoms in important biomolecules.

Understanding the structures of proteins and biomolecules is vital for understanding essential processes in the body, and is a vital part of modern drug design to make more effective pharmaceuticals which better interact with target proteins in the body.

“Dr Henderson’s work has paved the way for the recent advances in electron microscopy that are revolutionising structural biology by making it possible to determine atomic structures of large macromolecules without the use of crystals. The award recognises not only his own ground-breaking work in electron microscopy but also his work in advancing and disseminating his ideas to the point where they have reached fruition and are now used prolifically across the world.”

Sir Venki Ramakrishnan, President of the Royal Society

“It is a real thrill to be awarded the Royal Society’s Copley Medal for my work in this area. Particularly as it’s a prize that has been awarded to so many outstanding scientists since 1731. That’s amazing.”

Dr Richard Henderson FRS

Royal Society Pfizer Award

The Society’s Pfizer Award recognises research scientists who are making an innovative contribution to the biological sciences, including basic medical science, which contributes significantly to capacity building in Africa. In 2016, it was awarded to Dr Amina Abubakar Ali for pioneering psychological research in East Africa and her work developing neurodevelopmental assessments which are now being used throughout Africa.

In 2016/17 we celebrated the following outstanding achievements of our Fellows:

Nobel Prizes

Sir J Fraser Stoddart FRS won the Nobel Prize in Chemistry 2016 for the design and synthesis of molecular machines. His pioneering work on the design and manufacture of an entirely new class of chemical compounds has great potential in the field of nanoscale engineering. He shares the prize with Jean-Pierre Sauvage and Bernard L Feringa.

“It is wonderful news that Royal Society Fellow, Professor Sir J Fraser Stoddart FRS, has been awarded the Nobel Prize in Chemistry this year. We offer congratulations to him and to Jean-Pierre Sauvage and Bernard L Feringa, who share the prize, on this great achievement. Their work demonstrates the potential for chemists to construct tiny molecules which behave like machines, moving in response to a stimulus. These minute machines have laid the groundwork for potential future applications in a range of fields, from health to the miniaturisation of smart devices.”

Sir Martyn Poliakoff CBE FRS, Vice President and Foreign Secretary of the Royal Society.

Professor Frederick Duncan M Haldane FRS and Professor David J Thouless FRS have won the Nobel Prize in Physics 2016 for theoretical discoveries of topological phase transitions and topological phases of matter. They share the Prize with Professor J Michael Kosterlitz.

“I am delighted to hear that two Royal Society Fellows, Professors Haldane and Thouless, have been awarded the Nobel Prize in physics this year. We offer our congratulations to them and to Professor Kosterlitz on this great achievement.”

Professor Alex Halliday FRS, Vice President and Physical Secretary of the Royal Society.

Brain Prize

Professor Ray Dolan FRS and Professor Wolfram Schultz FRS, have won the prestigious Brain Prize alongside Professor Peter Dayan for their analysis of how the brain recognises and processes reward. Their work has far-reaching implications for understanding human behaviour, including decision-making, gambling, drug addiction, compulsive behaviour and schizophrenia. The Brain Prize is awarded by the Grete Lundbeck European Brain Research Foundation in Denmark.

Supporting outstanding science

Through our funding programmes, we work in partnership with universities and industry, both within the UK and internationally, to support excellent scientists. Our Fellowships support scientists by providing the stability, freedom and flexibility needed for researchers to develop their ideas.

The majority of our expenditure is in supporting outstanding scientists through our grant programme. This year we have supported:

Early career Fellowships

- 298 University Research Fellows, 45 new appointments
- 41 Dorothy Hodgkin Fellows, 13 new appointments
- 151 Sir Henry Dale Fellowships, 45 new appointments
- 36 Industry Fellows, 12 new appointments
- 40 new early career Fellows provided with mentors
- 6 early career Fellows matched to mentors focusing on female research leaders
- 100 scientists trained on media and communication skills, grant writing, engaging the public and innovation and the business of science.

Senior Fellowships

- 20 Research Professorships, 6 new appointments
- 251 Wolfson Research Merit Award holders, 45 new awards
- 7 Royal Society Leverhulme Trust Senior Research Fellowships.

Resources for research

- 8 research teams awarded up to £250,000 in funding to refurbish laboratories
- 7 Theo Murphy Blue Skies awards
- 138 research grants of £15,000 awarded
- 19 £150,000 research grants awarded.

Meet the scientists: Research Fellows

Dr Paul Williams

University Research Fellow

“A defining moment in my career since taking up the University Research Fellowship was addressing the world’s media at a press conference in Vienna in 2013.”

“I told them about our new study into how aviation turbulence was becoming stronger because of climate change. An independent media expert has estimated that one billion people worldwide heard about this research, which is very gratifying.”

Dr Paul Williams, Royal Society University Research Fellow (URF) and Associate Professor in the Department of Meteorology at the University of Reading. He was awarded his Fellowship in 2009 and an extension of his Fellowship in 2014. He is now in his final year as a URF.

I study the atmosphere and ocean, focusing on the areas of fluid dynamics, climate change and computational modelling. I am interested in how waves, turbulence and jet streams are generated and how they will respond to climate change. I am also interested in improving computer simulations of the atmosphere and ocean, by designing better algorithms and adding random numbers to represent things like clouds and turbulent ocean currents. These are challenging scientific problems with important societal implications.

The aviation turbulence forecasting algorithm I co-developed is now being used operationally by the US National Weather Service. Every day, turbulence forecasts made with this algorithm are used in flight planning by pilots, aircraft dispatchers and air traffic controllers. These forecasts have improved the comfort and safety of air travel on the 700 million plane journeys made by Americans annually. Secondly, the time-marching algorithm I invented is now being used in dozens of atmosphere, ocean and climate models worldwide. It has significantly increased the accuracy and skill of these models. For example, it has improved simulations of regional climate, brought ocean simulations into better agreement with observations, improved the energy conservation in ice sheet simulations and improved the skill of medium-range weather forecasts.”

Meet the scientists: Research Fellows

Daniel Streicker

Sir Henry Dale Fellow

“This work directly addresses an important problem for all Latin American countries.”

Daniel Streicker, Sir Henry Dale Fellow based at the Institute of Biodiversity, Animal Health and Comparative Medicine, at the University of Glasgow. His main research focus is vampire bats in Peru and their role in spreading diseases to livestock. In 2016 he was awarded a Challenge Grant for a study of oral vaccination of vampire bats for rabies control in Latin America.

“Livestock is of strategic importance to economic development in Latin America and remains integral to the food security of local populations. Vampire-bat-transmitted rabies causes a lethal infection that threatens livestock production throughout the region and the burden of the disease is rising.

This research is evaluating oral vaccine delivery to wild bats by combining field experiments and statistical models. Specifically, we are using biomarkers to study ingestion of a ‘mock’ vaccine after topical application to bats and the degree of diffusion of vaccine to other bats through social grooming.

Mathematical models will be developed to estimate the vaccination coverage that could be attained with our delivery strategy and whether this would be sufficient to reduce the burden of rabies in humans and livestock.”

Meet the scientists: industry programme

Dr Moi Hoon Yap

Royal Society Industry Fellowship

The skin is our largest organ, and face skin is particularly important as it affects our perception and behaviour – research shows people with younger looking or better skin have more confidence than others.

With the growth of the cosmetic and skincare industries, the demand for an improved shopping experience is increasing and an emerging trend is the use of 'try-on' technology that utilises augmented reality on mobile applications.

During Dr Moi Hoon Yap's Industry Fellowship she will be working with Image Metrics (IM), a leading provider of mobile applications for the cosmetics industry, responsible for developing the 'Makeup Genius' augmented reality app in collaboration with L'Oréal. This try-on app has over 20 million users worldwide and acts as a digital mirror to visualise the make-up products on the user's face.

Building on Dr Yap's background in face wrinkle detection and quantification and using approaches involving Hessian Line Tracking and a Multiscale Wrinkle Patterns algorithm, this project will develop a mobile application framework to automatically detect and quantify wrinkles thereby improving the realism of the try-on technology.

Meet the scientists: Research Fellows

Rebecca Kilner

Wolfson Research Merit Award

and Theo Murphy Blue Skies Award

"We were in a bit of a catch-22 situation: we needed more money to develop our idea, but our idea was too risky to be attractive to most funders. The Theo Murphy scheme offered the perfect way out of this dilemma."

Rebecca Kilner, Wolfson Research Merit Award and Theo Murphy Blue Skies Award holder at the University of Cambridge. She received the Theo Murphy Blue Skies Award to investigate the role of microbes in animal evolution.

"I want to get a better idea about the role that microbes play in influencing animal evolution. Figuring out the answer to this problem could keep us busy for the next ten years. Right now, I want to gather enough data to make a compelling case for a larger grant to really develop our new idea about this. It will involve new techniques for our lab, and developing new protocols. With my teaching time bought out by this award, I now have the time to focus on this work.

This scheme gives us the security to fail when trying new techniques, so that we can find an approach that we know will work before applying for further funding.

I hope this research will give us new insights into the processes that generate biodiversity and therefore a better understanding about what needs to be done to conserve it. One of the joys of doing research is the unexpected direction of travel, and the unimagined destinations. I certainly didn't think we would be embarking on a project like this two years ago, so who knows where we will be in two years' time."

Early career Fellowship

Professor Rahul Raveendran Nair, Royal Society University Research Fellow at the University of Manchester.

“Realisation of scalable membranes with uniform pore size down to atomic scale is a significant step forward and will open new possibilities for improving the efficiency of desalination technology. This is the first clear-cut experiment in this regime. We also demonstrate that there are realistic possibilities to scale up the described approach and mass produce graphene-based membranes with required sieve sizes.”

Professor Rahul Raveendran Nair is a Professor of Materials Physics and Royal Society University Research Fellow based at the National Graphene Institute and the School of Chemical Engineering and Analytical Science at the University of Manchester.

He was awarded the University Research Fellowship in 2014 for exploration of new science and technology in novel layered materials, particularly graphene. One of his main research themes is graphene-based membranes and their applications. A group of scientists at The University of Manchester led by Professor Nair has built on previous research on graphene-oxide membranes developed at the National Graphene Institute, developing graphene-oxide membranes which are able to sieve common salts out of salty water, making it safe to drink. This research has attracted significant attention, as this technology has the potential to revolutionise water filtration across the world, in particular in countries which cannot afford large-scale desalination plants.

Senior Fellowship

Sir Andrew Wiles FRS, Royal Society Research Professor at the University of Oxford.

“Receiving the Royal Society Research Professorship enabled me to return to the UK, and allowed me to focus on research free from most administrative duties. This has given me the opportunity to devote myself to very long-term projects free from distraction. I feel that it is in this situation that I am most productive and in which I can contribute most to my field.

There are now a great many very talented young mathematicians in number theory, and particularly in the area of number theory in which I am working. However it seems to happen that periodically roadblocks appear that seem insurmountable and I most enjoy the challenge of tackling these questions, which most people tend to avoid. This is what I have been doing with the support of the Royal Society.”

A Royal Society Research Professor since 2009, Sir Andrew is a mathematician working in number theory, and is best known for his proof of Fermat's Last Theorem.

Early career Fellowship

Amanda Sferruzzi-Perri,
Dorothy Hodgkin Fellow,
University of Cambridge.

“My research is focused on understanding the unique relationships between the mother, placenta and foetus which govern pregnancy success and lifelong health. I am particularly interested in identifying the signals secreted by the placenta that alter the metabolism of the mother in favour of foetal nutrient supply. I want to determine what role the signals play in regulating growth of the foetus, the health of the mother and the well-being of her child.

This research is important as impaired placental function disrupts the allocation of nutrients between the mother and her developing baby. This can lead to pregnancy complications, including gestational diabetes and abnormal birth weight, which have immediate and long-term consequences for maternal and offspring health.

The Dorothy Hodgkin Fellowship scheme appealed to me as it offers the option of claiming back time spent on parental/caring responsibilities. As the primary care-giver for our daughter, this enables me to balance my personal life with my ambition for a successful, independent research career.”

Early career Fellowship

Steven Spoel,
University Research Fellow,
University of Edinburgh.

“My laboratory studies how plants defend themselves against attack by pathogens that can cause devastation to food crops. These studies help us understand how plant and animal cells can better survive stresses (eg pathogen attack) by orchestrating dramatic reprogramming of gene expression to favour defence responses over normal cellular functions.

The University Research Fellowship (URF) has allowed me to set up an independent research group with a predominantly blue-skies research focus. As plant research is increasingly becoming an industrial focus, blue-skies academic plant science is under significant funding pressure. The final years of my URF partially alleviate this pressure by allowing us the freedom to move several of our key fundamental findings from plant cells into cell types that are considered more conventional models in biomedical sciences. Without URF funding this journey into more interdisciplinary science would be much more difficult to achieve.”

Publishing

- 30 million article downloads from our journals in 2016, a 25% increase on 2015
- 7,000 submissions to our research journals received
- 2,800 articles published in 2016, an 11% increase on 2015
- 38% of all articles were published with immediate open access in 2016.

Providing scientific advice for policy

We strive to ensure that policy-makers have access to expert, independent scientific advice, while extending the reach, impact and influence of our policy work with UK, European and international decision makers.

Machine learning

In 2016/17 we have promoted the important role of data science and digital technologies in advancing research, policy, industry and education by delivering work on cybersecurity, machine learning and data governance.

The *machine learning* project explored the opportunities that machine learning technologies present, their societal impact and the research challenges that will help shape the sector. This project has involved engagement with policy, industry and research audiences, public dialogue with Ipsos MORI and a series of popular public events.

A policy report with recommendations for government, industry and academia was published in April 2017, drawing from workshops with 200 practitioners, in addition to over 1,500 wider contributors from public dialogues. Highlights of the programme of public engagement which accompanied the machine learning report included an event at the Royal Festival Hall with Professor Brian Cox FRS – which over 2,000 people attended in person, and over 6,000 viewed online – sessions at the Northern Ireland Science Festival, New Scientist Live, Science Museum Lates and a programme of joint events with the British Academy on AI, Robotics and Society.

Cybersecurity

Progress and research in cybersecurity was published in July 2016. Our report makes recommendations on trust, resilience, research and translation which together highlight the critical need for cybersecurity in an increasingly digital society. This will require an ambitious programme of research and innovation to generate new security approaches and products, as well as establishing clear standards to help users identify trustworthy digital products and services.

Data management and use

A joint project with the British Academy, *Data management and use* is examining new uses of data and their implications, and reviewing the existing data governance landscape. The aim is to be able to connect debates across sectors and set out a shared vision for a digitally-enabled society; a vision that can determine overarching principles for fair, well-managed data use. The project will be published in summer 2017.

“We face global problems – hunger, disease and environmental threats do not respect borders. So we should seek to address those global problems on a global stage. That means working together to ensure that the benefits of new technologies – and I personally believe that those benefits can be great – are as widely spread as possible.”

Sir Venki Ramakrishnan, President of the Royal Society, speaking at the AAAS conference in Boston, February 2017, where we launched a major programme of work on genetic technologies.

This work, ongoing in 2017/18, will explore the potential and risks of biotechnology and in particular genetic technologies and how they can be applied in agriculture, in industry, to conserve biodiversity and to improve human health.

Education: broadening the curriculum

Our *Vision for science and mathematics education* recommended that all students should study science and mathematics to age 18. In 2016/17 our focus has been to keep this ambition on the political agenda, and as proposals for new, broader qualifications are discussed, we have recommended broadening the curriculum, so that all young people study science and mathematics up to the age of 18.

Schools that work for everybody

In December 2016 the Society responded to the Government's green paper, *Schools that work for everyone*, raising concerns that the proposals may only support a small proportion of disadvantaged pupils.

“New research commissioned by the Royal Society shows that in wholly selective local authorities, students receiving free school meals (FSM) achieve lower grades in GCSE mathematics. In these areas there are also fewer FSM students taking double or triple science GCSEs. These are subjects which open doors for young people.

Schools that work for everyone must place priority on ensuring that all young people receive high-quality science and mathematics education which equips students with the skills they need to prosper in a rapidly changing world. Irrespective of the role of selective schools in our education system, our schools must support students from every background to fulfill their potential.”

Professor Tom McLeish FRS, Chair of the Royal Society's Education Committee.

Fostering international and global cooperation

Science is an international activity and we are strengthening links with academies, funders and governments in Europe, the USA and beyond as well as supporting other countries who are building their own scientific strength.

Our support for scientists

The Newton Fund

Newton International Fellowships awarded through the Newton Fund (in partnership with China, India, Mexico, Turkey, South Africa, Brazil, Malaysia and Thailand) support the best postdoctoral researchers from around the world to work in UK institutions for up to two years.

- 28 Newton Advanced Fellowships awarded
- 51 Mobility Grants awarded.

Global Challenges Research Fund (GCRF)

GCRF funding is available for research addressing significant problems or development challenges and directly contributing to the sustainable and inclusive prosperity of people in developing countries.

- 34 Challenge Grants awarded
- 10 International Collaboration Awards made
- 3 University Research Fellowships and 2 Dorothy Hodgkin Fellowships funded through the GCRF.

Other international awards

- 24 Newton International Fellowships awarded
- 9 privately funded international Fellowships awarded to postdoctoral scientists from the USA, Israel, China and Italy.
- 217 International Exchanges grants made
- 7 International Scientific Seminars funded
- 300 researchers selected to attend the Commonwealth Science Conference 2017.

Meet the scientists: International Fellowships

Dr Anand Prakash Maurya

Royal Society-SERB* Newton International Fellowship

“Antimicrobial resistance is becoming a global concern and one of the greatest threats to human health, and it is rising day by day. So, we need to address it urgently – if it is not addressed by 2050, it could kill more people than road traffic accidents or cancer.”

For the duration of his Fellowship, Dr Maurya is based at the University of Birmingham, conducting research into elimination of bacterial plasmids responsible for spread of antibiotic resistance genes, under the supervision of Professor Christopher Thomas.

“There were several reasons I applied for a Newton International Fellowship. Firstly, as this Fellowship is a collaboration between the United Kingdom and India, both the individual (me) and the countries benefit from it. The Fellowship is provided by the Royal Society which is one of the most prestigious scientific academies; this allows me to meet other researchers in my field, develop my research network and establish collaborations. Also, my Fellowship is enabling me to work with a world-leading expert, Professor Christopher Thomas, who is a pioneer in my research field.

Antimicrobial resistance is a growing challenge worldwide, for various reasons including overuse and use without prescription, as well as lack of proper control policy. The host laboratory for my Fellowship, Professor Thomas's lab, has been pioneering a response which is called ‘plasmid curing’, or a ‘pCURE’ system. We are trying to manipulate plasmids and make an efficient plasmid (pCURE system) that can displace the bacterial plasmids that cause bacterial resistance. I am trying to make an efficient plasmid that will displace the resistance-causing plasmid from the gut microbiome.

My research could have great impact in future, as curing of plasmids is one alternative approach which could restore the ability to control infection by pathogenic strains. Plasmids are quite diverse and have a broad host range and complex organisation, so understanding their biology will help to underpin their exploitation.”



Above

Dr Anand Prakash Maurya, awarded the Royal Society-SERB Newton International Fellowship in 2016.

*Science and Engineering Research Board (of India).

Meet the scientists: International Fellowships

Dr Nadia Martinez Villegas

Newton Advanced Fellow



Above

Dr Nadia Martinez Villegas, Newton Advanced Fellow and Associate Professor of Geochemistry at the Instituto Potosino de Investigacion Cientifica y Tecnologica in Mexico.

“One of the things that is exciting about my work is the opportunity to discover how arsenic interacts with the ecosystem that survives in such a contaminated environment.”

Dr Nadia Martinez Villegas was awarded the Newton Advanced Fellowship in 2015, for a collaboration with Professor Bhaskar Sen Gupta at Heriot-Watt University.

“I study arsenic in the environment. There were unbelievably high concentrations of arsenic reported as having been found in the surface and groundwater of a particular semi-desert area in Mexico. I wanted to know the origin of that contamination, how it varied over space and time, and the extent and the impact of its pollution.

The support of the Newton Advanced Fellowship is helping me to better understand the chemistry of the contaminant, and in turn how we could help the people affected. The experience of Professor Sen Gupta in helping people

to have access to safe water is enabling me to approach the social problematic of arsenic in my study area. Arsenic has contaminated water, soil and crops, as well as people, as measured by arsenic concentration in their hair. The lack of awareness and poverty in Cerrito Blanco, Matehuala, in the San Luis Potosi state in Mexico seem to combine to exacerbate the arsenic exposure problem.

We are looking to estimate the risks to the rural population exposed to arsenic, and the pollution of arsenic in agricultural soils. We are also looking to educate the population to avoid arsenic, to the extent it is possible to do so. Without the support of this Fellowship, I would not have had the opportunity to do this for my people, at least not at this stage of my scientific career.”

Meet the scientists: International Fellowships

Gad Frankel

Royal Society International Collaboration Award

“Frequent episodes of diarrhoea lead to stunted growth and the associated delay in developmental milestones can have an impact even later in life. Our research aims to understand why these frequent episodes of diarrhoea cause such severe illness.”

Frankel is Professor of Bacterial Pathogenesis at the Department of Life Sciences and the MRC Centre for Molecular Bacteriology and Infection (CMBI) at Imperial College London.

“We were attracted to the Royal Society International Collaboration Awards scheme to fund our Enterotoxigenic *Escherichia coli* (E coli), or ETEC, project as there was no need for extensive preliminary data and as we appreciated it will allow the exchange of personnel between the two laboratories.

Diarrhoeal disease is a major cause of illness around the world, but the worst affected are children in developing countries. In endemic low- and middle-income countries in Africa and Southeast Asia, strains of ETEC that produce the enterotoxin ST and LT cause 280 – 400 million cases of diarrhoea in children under five years of age and over 300,000 deaths annually.

Our research aims to understand why frequent episodes of diarrhoea cause such severe illness. Are there permanent changes in gut physiology as a result of fluid and salt loss during diarrhoeal episodes? Are there changes in the gut microbiome that now result in sensitivity

to certain dietary factors? Do these changes in the microbiome increase the susceptibility to other infections? We will use mouse models that mimic the disease seen in humans, and study the changes in the gut using advanced molecular and cell biology approaches. We anticipate that our work will lead to a greater understanding of the changes that occur in the gut that may also be seen in individuals that suffer from irritable bowel syndrome, Crohn’s disease and colon cancer.

At the CMBI at Imperial College we identified the Indian Institute of Science in Bangalore as an ideal strategic partner. In one-on-one meetings it quickly became apparent that our interest in understanding the complexities of diarrhoeal disease was complementary. We see engagement of young researchers working in our lab in a collaborative project between UK and India as an important added benefit. More generally, with changes in the economic climate of the UK and the growth of India as scientific force, our collaboration would showcase what is possible when these two historically linked nations attack a problem primarily relevant to the needs of developing countries, but also to the UK.”



Above

Gad Frankel, awarded a Royal Society International Collaboration Award in 2016 for a collaboration with Professor Sandhya Visweswariah from the Indian Institute of Science in Bangalore.

European Union: making the case for science

Ahead of the EU Referendum and since its outcome, we have worked with our Fellows to achieve the best possible outcome for science, collaborating with our sister and European academies, engaging in parliamentary activities and collaborating with other organisations to support research and innovation in post Brexit Britain.

In advance of the referendum, we published three reports on the role of the EU within UK research to inform debate. Following the result we successfully argued for the Government to underwrite the value of any European grants awarded to UK researchers for the full award period. We welcomed the inclusion of science and innovation in the Prime Minister's 12 priorities for negotiations on leaving the EU and we launched a social media campaign, #SciencelsGlobal, to emphasise the importance of the international nature of research – to date it has reached almost 10 million people globally.

“One of the great strengths of UK research has always been its international nature, and we need to continue to welcome researchers and students from abroad. Any failure to maintain the free exchange of people and ideas between the UK and the international community including Europe could seriously harm UK science. In the past, UK science has been well supported by EU funding. This has been an essential supplement to UK research funds. In the upcoming negotiations we must make sure that research, which is the bedrock of a sustainable economy, is not short changed, and the Government ensures that the overall funding level of science is maintained.

Many global challenges can only be tackled by countries working together and it is easier to work together when policy and regulation are consistent. In negotiating a new relationship with the EU we must ensure that we do not put unnecessary barriers in place that will inhibit collaborations.”

Sir Venki Ramakrishnan, President of the Royal Society, in response to the UK's decision to leave the European Union.

Commonwealth Science Conference 2017: a unique opportunity to discuss common challenges

Building on the legacy of our 2014 Commonwealth Science Conference, we are working with the National Research Foundation of Singapore on the next Commonwealth Science Conference, which will take place in June 2017.

The conference will bring together leading scientists to showcase the best science from across the Commonwealth – providing opportunities for cooperation between researchers. It aims to inspire young scientists, students and pupils, build understanding about policy issues of common interest and encourage scientific capacity building. Areas of focus include new technologies, the future of the oceans, emerging infectious diseases, sustainable cities and low carbon energy.

Education and Public Engagement

Science is central to modern culture and the Society is committed to increasing opportunities for everyone to engage with science, both through the formal education system and in other ways.

How our activities reached people

- 43,700 people attended our events during the year
- 19,000 of those attended an event outside London
- 46% of attendees who filled in a feedback form from one of our events were male, 51% were female.

Summer Science Exhibition 2016

Over 14,000 visitors attended our flagship event, the Royal Society Summer Science Exhibition. The event included 21 exhibits of cutting-edge UK-based scientific research and technology.

Science Matters series with Professor Brian Cox FRS

The Royal Society's *Science Matters* series gives the public access to scientists who are experts on the science and technology issues with the greatest global impact.

- 3,700 tickets sold
- 6,300 watched livestream
- 43,000 YouTube views.

Questions asked by participants during our Science Matters series

- Have we gone past the 'tipping point' or can we save the planet?
- Why is there so much scepticism behind GM crops?
- How do we stop machines enslaving us?
- What one change would have the single biggest impact to slow down climate change?
- Any recommendations for AI-proof careers?
- How do we know science is real?

Experimental science videos

In March 2017 we launched we a series of 24 experimental videos for schools with Professor Brian Cox, the Society's Professor of Public Engagement in Science, to increase teachers' confidence with experimental science and relate the experiments to the real world.

People of Science

Filming is underway for a series of *People of Science* films featuring Professor Cox interviewing Fellows of the Royal Society about a figure from science who they admire. The first four films will be released on our YouTube channel in autumn 2017 featuring Bill Bryson FRS, Sir David Attenborough FRS, Dame Sally Davis FRS and Professor Uta Frith FRS.

Partnership Grants

Our Partnership Grants scheme provides grants for science, engineering and mathematics projects run at primary and secondary schools and colleges in partnership with a STEM professional. In 2016/17 we awarded 37 grants to 15 successful primary schools and 22 successful secondary schools, totalling £88,505.

Royal Society archives

Items from the Royal Society archives, including the Shelton chronometer used in James Cook's second voyage, feature in the video work of the 2017 Venice biennale representative of New Zealand, the artist Lisa Reihana. *In pursuit of Venus (infected)* will be exhibited at the Royal Academy after its run at the biennale (this is to be confirmed).

Fundraising and development: support for the Royal Society

The Society has relied on the generous support of philanthropists throughout its history. This year the Society received funding from trusts, foundations, companies and individuals enabling the Society to deliver a wide range of programmes in support of its strategic aims. The following case studies illustrate the breadth of the activities for which the Society receives valued support.

The Royal Society Tata Programme for the Physical Sciences and Engineering

In June 2016 the Society launched a new partnership with the Tata Group. The Royal Society Tata Programme for the Physical Sciences and Engineering will expand the Society's University Research Fellowships (URF) programme, aiming to support nine new URFs over ten years.

In addition to the new URFs, Tata is also supporting an annual *Meeting of Minds* event which will be hosted in 2017. The event will bring together the Royal Society Tata URFs and other Royal Society research fellows including Royal Society URFs, Dorothy Hodgkin Fellows, Industry Fellows and Newton International Fellows. This annual event brings together the research fellows to inspire the cross-fertilisation of ideas and expertise to encourage innovation across the disciplines.

The expanded programme would not have been possible without the support of Tata Sons Limited, Tata Consultancy Services and Jaguar Land Rover.

The Royal Society Insight Investment Science Book Prize

Insight Investment became a new corporate partner for the Society in 2016, thanks to their support of what is now known as 'The Royal Society Insight Investment Science Book Prize'. The Royal Society's prize for science books is the only major international prize to celebrate science writing for a general audience. The new agreement with Insight Investment has secured the prize for a further three years, during which it will celebrate its 30th anniversary in 2017.

The Royal Society Insight Investment Science Book Prize is important to the Society's mission of promoting the value of science to a wide audience, beyond the scientific community, to encourage as many people as possible to engage with science.

The Royal Society Lisa Jardine Research Awards

Professor Lisa Jardine CBE FRS spent a lifetime of research working in Renaissance and Early Modern disciplines, partly in history of science, but most characteristically in interdisciplinary studies within the seventeenth and eighteenth centuries. Lisa was made an Honorary Fellow of the Royal Society in 2015 for her contribution to the history of science. She passed away in October 2015. Thanks to the support of Lisa's family and friends, the Society is able to fund the Royal Society Lisa Jardine Research Awards in her memory. The awards will begin in 2017, and will support early career scholars providing access to the archive sources, with particular access to the Society's own archives. The Society is proud to be able to continue Professor Jardine's legacy and promote interdisciplinary scholarship.

Science on Stage

In February 2017, the Society secured funding to support the attendance of twelve UK teachers at the Science on Stage Europe festival and give them the opportunity to participate in the post-festival activities. The Society's ability to support the attendance of these teachers is due to the support of the Ogden Trust and seven of the Society's Fellows.

Science on Stage is Europe's biggest educational festival for STEM teachers. The Science on Stage festival provides a platform for science teachers to share inspirational high-quality activities and exchange ideas, projects and teaching concepts at stands, workshops and on stage.

Thank you

The Society is grateful for the outstanding level of support from all our donors listed below and those who have chosen to remain anonymous over the last financial year.

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AstraZeneca UK Limited
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Mrs Natalia Benjamin
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The Ogden Trust
Queen Elizabeth Diamond Jubilee Trust
Society of Chemical Industry
Sino-British Fellowship Trust
The Woodward Charitable Trust
The Wolfson Foundation
K. C. Wong Education Foundation

Legacies

Mr Michael Crowley-Milling
Mr Felton Downes
Dr Marjorie Ann England
Mr George Hitchen
Mrs Janet Smith

Financial review

Income

In the year to 31 March 2017, the Royal Society's income increased by 10%, from £77.7m to £85.2m. The majority of the Society's income came from grants for charitable activities, which increased by 12% during the year to £64.9m (2016: £58.1m). The Society's core grant from the Department for Business, Energy and Industrial Strategy (BEIS) was £47.2m (2016: £47.1m). In addition to this, the Society received income from BEIS in respect of £5.5m (2016: £4.0m) in support of the Newton Fund Academies' Programme which aims to develop science and innovation partnerships that promote economic development and social welfare of partner countries. BEIS also provided a grant to the Society of £4.8m (2016: £nil) under the Global Challenges Research Fund (GCRF), which aims to support cutting-edge research addressing the challenges faced by developing countries.

Income from donations and legacies decreased slightly on the prior year to £3.2m (2016: £3.6m). Included in this is a new £1.0m expendable endowment from the Darwin Trust in support of a Professorship.

Trading in furtherance of charitable objectives increased during the year by £1.3m to £10.3m (2016: £9.0m) due to successful trading years for both publishing and conferencing. Income from publishing increased by £0.6m, from £6.3m in 2016, to £6.9m. Conferencing income from Carlton House Terrace also increased by £0.6m, to £3.0m (2016: £2.4m).

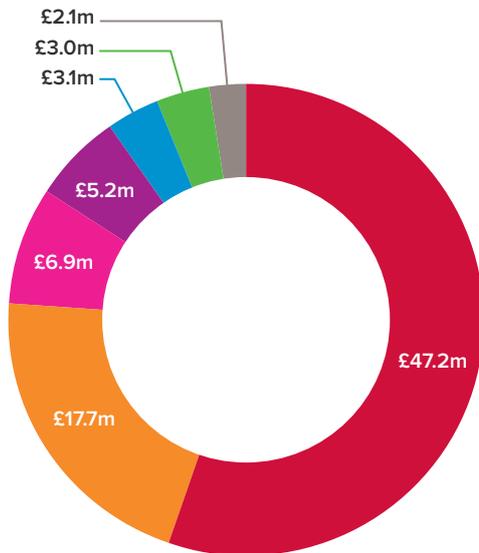
Income from investments remains broadly in line with the previous year at £5.2m (2016: £5.3).

Expenditure

Total expenditure increased by 13% on the prior year from £77.5m to £87.3m, as the Society has continued to expand its charitable programme. Expenditure on charitable activities increased from £73.4m to £83.1m, and remains around 95% of total expenditure, in line with 2016. The majority of the Society's charitable expenditure is grant awards; this year accounting for £61.2m (2016: £53.5m). The largest changes to the grant programme included the introduction of new Challenge grants, supporting research that addresses the challenges faced by developing countries through challenge-led disciplinary and interdisciplinary research, which accounted for £3.5m of expenditure in the period. The Newton International Fellowships and Advanced Fellowships were expanded during the year, increasing by £1.2m and £0.5m respectively. Grants made under the DFID Africa programme also increased during the year from £1.4m to £2.3m.

Aside from grants activity, expenditure on providing scientific advice for policy increased during the year as the Society expanded its work in this area, particularly in respect of data, cybersecurity and education.

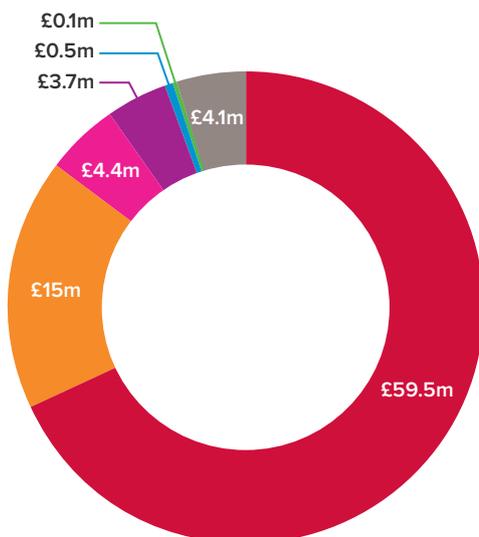
Income



Total Income £85.2m
(2016: £77.7m)

- Core BIS grant
- Grant income
- Publishing income
- Investment income
- Donation income
- Conferencing income
- Trading and other income

Expenditure



Expenditure £87.3m
(2016: £77.5m)

- Supporting outstanding science
- Fostering international and global cooperation
- Education and public engagement
- Providing scientific advice for policy
- Promoting science and its benefits
- Recognising excellence in science
- Expenditure on raising funds

Grants

The grants made by the Society fall into two broad classes:

1. Fellowships

- Early-career Fellowships, Professorships;
- Senior Fellowships, and support for innovation and

2. Research grants

- Research grants, collaboration;
- Travel grants;
- Capacity-building grants;
- Education-related grants.

Grant applications are assessed by means of a peer-review process and consideration by a panel of experts comprising Fellows of the Royal Society and other senior scientists. Each panel is chaired by a Fellow of the Society.

Further information is available at royalsociety.org/grants/applications

The primary purposes of the Society's grant-giving activities are to support the work of outstanding individual scientists at various stages of their careers, primarily in the UK, and to encourage collaborations between UK scientists and scientists throughout the world.

Chicheley Hall – Royal Society Trading Limited

The Society acquired Chicheley Hall in 2008 with the aim of operating the property as a centre for scientific and academic conferences. In addition to holding mission related activities, the Hall is available for conferences and other events, and Royal Society Trading Limited was established to process the activities of the Hall. Since February 2013, the management of the property has been outsourced to De Vere Venues. The trading subsidiary recorded a loss of £102.8k in the year (2016: £20.0k). This has been attributed to a difficult trading environment, with lower than expected room rates and higher costs largely due to staff shortages in the local area. The Society began a review of operations at Chicheley Hall during the financial year which will determine a longer term strategy for the property.

Pension and Life Assurance Plan of the Royal Society

The Society operates a defined benefit pension scheme which was closed to new members in 2014. The valuation of the scheme at 31 March 2017 showed a deficit of £10.1m (2016: £8.6m). This represents the difference between the assets and the obligations of the fund rather than an immediate cash liability. In accordance with FRS102, the actuarial losses on the scheme of £1.6m (2016: gains of £1.7m) have been charged to unrestricted funds. A triennial valuation of the scheme was agreed during the financial year, under which the Society will make deficit contributions to the pension scheme of £0.7m during the next financial year. Current budget and forecasts indicate that the Society will be able to meet these contributions as they arise.

Investment policy and performance

On 23 March 2016, Council resolved to adopt a total return investment approach under section 105 of the Charities Act 2011, having concluded that this would best enable it to be even-handed between current and future beneficiaries. Accordingly, during the year Council approved a new investment policy on the recommendation of the Investment Committee.

The investment objective of the Society is to at least maintain the real value of its investment assets whilst generating a stable and sustainable return to fund charitable activities. The Society does not invest in organisations which conflict with the Charity's purpose, or where Council deem that to do so would hamper the Charity's work, for example by alienating those who support the Society financially. Council have resolved that the Society should not invest in companies or funds that derive a significant portion of their income from the sale or manufacture of tobacco products.

The value of the Society's investment portfolio increased substantially in the year, from £200.1m in 2016 to £243.9m in 2017 including unrealised gains of £39.6m (2016: losses of £11.2m).

Remuneration policy

The aim of the Royal Society's remuneration policy is to maintain sustainable, fair levels of pay at the same time as attracting and retaining the right people to deliver our charitable objectives. In setting appropriate levels of senior management pay, the Society considers the skills, experience and competencies required for each role, and the remuneration level for those roles in sectors where suitable candidates would be found. Remuneration packages for all staff are benchmarked using proprietary pay surveys and external advisers.

In accordance with the Charities' Statement of Recommended Practice (SORP), the Royal Society discloses all payments to Trustees (no Trustees are remunerated) and the number of staff with a total remuneration of £60,000 and above.

Reserves

The total funds of the Society increased by £36.9m to £293.3m during the financial year, mainly due to substantial increases in investment values.

The Society holds free reserves so that it can respond to unforeseen charitable opportunities and continue to honour existing commitments in the event of a shortfall of income. The Society's policy is to review its income streams and expenditure commitments on an annual basis, assess the main financial risks faced by the Society and their associated likelihood in order to develop a risk based reserves level. Freely available reserves are calculated by taking total unrestricted funds and deducting unrestricted tangible fixed assets and heritage assets. At the balance sheet date, the value of the Society's free reserves was £20.7m (2016: £18.6m), well above the target level of £14.0m. The Society continues to develop longer-term strategies to increase its charitable activities in a sustainable way which will reduce the reserves level whilst ensuring that it has adequate resources to enable it to respond to emerging risks and opportunities.

Statement of policy on fundraising

Section 162a of the Charities Act 2011 requires us to make a statement regarding fundraising activities because we have an external audit. We do not use professional fundraisers or 'commercial participators' or indeed any third parties to solicit donations. We are therefore not subject to any regulatory scheme or relevant codes of practice, nor have we received any complaints in relation to fundraising activities nor do we consider it necessary to design specific procedures to monitor such activities.

Enterprise Fund (Amadeus RSEF LP)

The Royal Society Enterprise Fund was created with the aim of becoming a financially successful contributor to early-stage science based companies in the UK and a role model for the translation of excellent science for commercial and social benefit. The Society entered into a Limited Partnership Agreement with Amadeus Capital Partners in 2014 to create the Amadeus RSEF LP. During the year the Fund made several new investments and enjoyed unrealised gains of £2.3m.

Governance

The Royal Society was founded in 1660 and incorporated by Royal Charter. The Society was granted a Supplemental Charter in 2012 and that now serves as its governing document. The governing body of the Society is its Council, whose members are elected by and from the Fellowship. Under the Charter, Council 'shall and may have full authority, power, and faculty from time to time to draw up, constitute, ordain, make, and establish such laws, statutes, acts, ordinances, and constitutions as shall seem to them, or to the major part of them, to be good, wholesome, useful, honourable, and necessary, according to their sound discretions, for the better government, regulation, and direction of the Royal Society aforesaid, and of every Member of the same, and to do and perform all things belonging to the government, matters, goods, faculties, rents, lands, tenements, hereditaments, and affairs of the Royal Society aforesaid.' Council may have between 20 and 24 members, and there were 23 in the year. Council is chaired by the President of the Society, and among its members are four Officers: the Biological Secretary, the Foreign Secretary, the Physical Secretary, and the Treasurer. The President and the Officers serve five-year terms and the other members serve three-year terms.

The Society is a registered charity and Council is the trustee body under charity law. Fellows are not remunerated for serving as Trustees. Council has complied with its duty to have due regard to the Charity Commission's public benefit guidance when exercising any powers or duties to which that guidance is relevant. Information about public benefit provided by the Society is presented in this Report. Changes in the Membership of Council took place as usual on 30 November (Anniversary Day). The new Members attended an induction session at which a partner in a leading charity-law practice and the Internal Audit Engagement Partner gave presentations on trustee duties and internal control. During the year, Council also received guidance from professional advisors on specific matters.

Council is supported by a range of committees, whose members include Fellows, other scientists, and other individuals with relevant expertise. Among the committees that report directly to Council are the following:

- Audit Committee, which advises Council on the adequacy and effectiveness of the Society's arrangements for governance, risk management, internal control, and value for money;
 - The Board, whose remit encompasses fund-raising and international affairs and consideration of urgent matters on behalf of Council;
 - Diversity Committee, which advises Council on diversity strategy and oversees associated programmes;
 - Education Committee, which advises Council on education-policy strategy and oversees associated programmes;
 - Grants Committee, which advises Council on grants strategy and oversees associated programmes;
 - Hooke Committee, which assesses proposals for scientific meetings to be held under the Society's auspices;
 - Investment Committee, which advises Council on investment policy, determines investment strategy, and oversees implementation of the strategy and the performance of the Society's investment managers;
 - Nominations Committee, which advises Council on candidates for election as members of Council and for appointment as chairs of committees and as members of Sectional Committees (see below);
 - Planning and Resources Committee, which is concerned with planning and allocation and use of resources, including recommending budgets and monitoring performance against them and overseeing provision of services;
 - Premier Awards Committee, which makes recommendations to Council on award of prizes by the Society;
 - Public Engagement Committee, which advises Council on public engagement strategy and oversees associated programmes;
 - Publishing Board, which is responsible for the policy and strategy of the Society's publishing programme, within scientific and financial objectives set by Council;
 - Science, Industry, and Translation Committee, which advises Council on science and industry strategy and oversees associated programmes;
 - Science Policy Advisory Group, which advises Council on the Society's work in science policy;
 - Sectional Committees, of which there are ten spanning the scientific disciplines, which determine shortlists of candidates for election to the Fellowship and the Foreign Membership for consideration by Council.
-

Audit Committee approves a programme of work related to the Society's internal control system to be carried out by the Internal Auditors during a forthcoming year, receives reports of Internal Audit reviews as they are completed, discusses matters raised in those reports with the Internal Auditors and management, and receives regular reports on progress in implementing actions arising from such reports. The Committee also discusses an Internal Audit annual report and matters arising from it with the Internal Auditors and management. The Committee also approves the external audit plan, discusses the audit and matters arising from it with the External Auditors and management, and makes recommendations to Council in relation to the Financial Statements and associated matters. The Committee reports to Council after each meeting. One matter for report in the year was advice by the Committee on the appointment of new External Auditors following a tender exercise. The Committee prepares an annual report to Council that covers external audit, internal audit, and other matters that it has considered during the year. The Committee receives papers for Council meetings to assist it in performing its role, and by invitation the Chair of the Committee attends each meeting of Council.

As at 31 March 2017, the Society had 185 staff. Council delegates responsibility for day-to-day management of the Society to the Executive Director. The Society's staff are organised into sections as follows:

- Programmes – Diversity, Grants, Industry Programmes, International Affairs, Library, Marketing and Public Engagement, Science Policy, and Scientific Programmes.
- Services – Communications, Corporate Management, Development, Facilities, Finance, Human Resources, and Information Technology.
- Trading – Conference Services and Publishing.

Related parties and relationships with other organisations

The Royal Society had two wholly-owned trading subsidiaries during the year, Royal Society Trading Limited 06967016 and Royal Society (London) Ltd 08808518.

The Society owns 100% of the £1 called-up and issued share capital of Royal Society Trading Limited which was set up to process the activities that occur at Chicheley Hall.

Royal Society (Australia) Pty Limited ACN 126112678 is the Trustee of the Royal Society Theo Murphy (Australia) Fund, an Australian company the shares of which are owned by the Society.

Details of related party transactions, including Trustees, can be found in note 12 to the financial statements.

Details of the remuneration of key management personnel are disclosed in note 9 to the financial statements.

Details of the two pension schemes operated by the Royal Society are disclosed in note 26 to the financial statements.

Going concern

The Trustees consider that there are no material uncertainties about the Society and its subsidiaries to continue as a going concern.

Statement of Trustees' responsibilities

The Council members (who are the Trustees of the Society) are responsible for preparing the Trustees' annual report and the financial statements in accordance with applicable law and United Kingdom Accounting Standards (United Kingdom Generally Accepted Accounting Practice), including FRS102 "The Financial Reporting Standard applicable in the UK and Republic of Ireland". Charity law requires Council to prepare financial statements for each financial year that give a true and fair view of the state of affairs of the Group and the parent charity and of the incoming resources and application of resources of the Group for the year.

In preparing those financial statements the trustees are required to:

- select suitable accounting policies and then apply them consistently;
- observe the methods and principles in the Charities SORP;
- make judgements and accounting estimates that are reasonable and prudent;
- state whether applicable accounting standards have been followed;
- prepare the financial statements on the going concern basis unless it is inappropriate to presume that the charity will continue in business.

Council is responsible for keeping proper accounting records that disclose with reasonable accuracy at any time the financial position of the group and parent charity and enable them to ensure that the financial statements comply with the Charities Act 2011 and regulations made thereunder. Council is also responsible for safeguarding the assets of the group and the parent charity, and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

Council is responsible for the maintenance and integrity of the charity and financial information included on the Charity's website. Legislation in the United Kingdom governing the preparation and dissemination of the financial statements and other information included in annual reports may differ from legislation in other jurisdictions.

Risk management

Council is responsible for ensuring that proper arrangements are in place for risk management. Council relies principally on Audit Committee, supported by the Internal Auditors, PricewaterhouseCoopers LLP, to assess those arrangements and to advise it accordingly. Audit Committee considered regular reports on risk-management systems and management of major risks, and Council considered regular reports from Audit Committee and also reviewed management of major risks, including using its own risk register. The risk registers of the Society's sections are also updated periodically and used in monitoring management of risks and communicating information about risks across the Organisation.

The Society's fundamental purposes are to promote, recognise, and support excellence in science and to encourage the development and use of science for the benefit of humanity. Its Strategic Plan for 2012 – 17 and subsidiary strategies and implementation plans define the overall framework for its activities by outlining how it will work to achieve those purposes. Towards the end of the year, Council approved a new Strategic Plan for 2017 – 22.

The broad political context in which the Society operates became more unsettled and more complicated during the year, in particular as a consequence of the referendum on the UK's membership of the European Union in June 2016. The Society undertook a broad range of actions to address risks to the continuing health of science – and hence the ability of science to contribute to the well-being of humanity – in the UK, in the rest of Europe, and globally, with particular focus on future international mobility of scientists and funding for UK science from EU sources.

The Society reflected frequently on uncertainties and on continuing risks to achieving its purposes and the effectiveness of the various means it employs to mitigate the risks. It was also vigilant in identifying new risks and taking steps to address them. Actions and processes often contribute to mitigation of several risks simultaneously. The Society works assiduously to develop and maintain relationships in order to ensure that its activities remain relevant, that its contributions are effective, and that the value of its work is recognised. The main risks identified by Council and action taken to manage them, including ongoing actions, are described below.

The Society's principal funder continues to be the Department for Business, Energy, and Industrial Strategy through an annual grant of long standing, and more recent grants from the Newton Fund and the Global Challenges Research Fund. The annual grant in 2016/17 was the same in cash terms as in 2015/16, and the grant for the next three years will be the same cash sum, a continuing fall in real terms that will have a negative impact on the Society's ability to support excellent science. The Society worked to strengthen existing relationships with a range of private funders and to develop new relationships, seeking thereby to secure additional funding and diversify its sources of funding. The Society strengthened its arrangements for financial planning, including introducing a new Financial Planning Model. It also took the steps needed to implement the new total-return

investment policy approved by Council towards the end of the prior year, which is expected to result in increased spending from endowment assets. The Society also increased the surpluses from its two primary-purpose trading activities – publishing of scientific journals and provision of conference services at Carlton House Terrace – which are its major sources of unrestricted income. Council continued to reflect on the trajectory of its open access publishing activities, which began in 2006. The Kavli Royal Society International Centre at Chicheley Hall continues to be a successful venue for scientific events but also to consume considerable resources, and during the year Council considered a report on future options. The Society also continues to consider the possibility of a new lease on its home at Carlton House Terrace. The Society nominated two new independent expert trustees for the Pension and Life Assurance Plan of the Royal Society and worked with the trustees to agree the triennial valuation as at 1 January 2016 and to update the rules of the Plan.

Over the past two years, the Society has expanded many of its programmes – especially in grant-giving, providing science-policy advice, and engaging the public with science – and has taken on several new activities. A major challenge is to enable as much fruitful activity as possible towards the Society's strategic goals while ensuring financial sustainability over the long term. This broad question will continue to be a main focus for the Society. Related to it will be attention to the overall size and shape of the Society, maintaining the high quality of all of its work, and ensuring that the organisation is resilient. In relation to resilience, the Society will continue to strengthen its IT systems, infrastructure, and security and the provision of IT services, taking account of developments in IT generally. During the year the Society introduced a new data strategy and policy, and work will continue to embed them in operations. The Society also made further improvements to its HR policies, procedures, and systems. Work continues to ensure that the roles of Officers are properly defined and appropriate to the Society as it now is and to the

evolving environment, and that there are adequate means for Officers to be held to account by Council and the Fellowship. Council considered reports from working groups to examine questions concerning criteria for eligibility for election to the Fellowship and the election process, and it is envisaged that recommendations from them will be implemented in the coming year. Finally, questions about the size and shape of the Fellowship will continue to receive attention as the scientific landscape evolves, as will questions about the Society's role as the science academy of the UK and of the Commonwealth.

This report was approved by Council on 4 July 2017 and signed on their behalf by:



Venki Ramakrishnan
President of the Royal Society

Independent auditor's report to the Trustees of the Royal Society

We have audited the financial statements of The Royal Society of London for Improving Natural Knowledge (commonly known as The Royal Society) for the year ended 31 March 2017 which comprise the consolidated statement of financial activities, the consolidated balance sheet, the consolidated cash flow statement and the related notes. The financial reporting framework that has been applied in their preparation is applicable law and United Kingdom Accounting Standards (United Kingdom Generally Accepted Accounting Practice).

This report is made solely to the charity's trustees, as a body, in accordance with the Charities Act 2011. Our audit work has been undertaken so that we might state to the charity's trustees those matters we are required to state to them in an auditor's report and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the charity and the charity's trustees as a body, for our audit work, for this report, or for the opinions we have formed.

Respective responsibilities of trustees and auditors

As explained more fully in the statement of trustees' responsibilities, the trustees are responsible for the preparation of the financial statements and for being satisfied that they give a true and fair view.

We have been appointed as auditors under section 144 of the Charities Act 2011 and report in accordance with regulations made under that Act. Our responsibility is to audit and express an opinion on the financial statements in accordance with applicable law and International Standards on Auditing (UK and Ireland). Those standards require us to comply with the Financial Reporting Council's (FRC's) Ethical Standards for Auditors.

Scope of the audit of the financial statements

A description of the scope of an audit of financial statements is provided on the FRC's website at www.frc.org.uk/auditscopeukprivate

Opinion on financial statements

In our opinion the financial statements:

- give a true and fair view of the state of the group's and parent charity's affairs as at 31 March 2017 and of the group's incoming resources and application of resources, including the income and expenditure, for the year then ended;
- have been properly prepared in accordance with United Kingdom Generally Accepted Accounting Practice; and
- have been prepared in accordance with the requirements of the Charities Act 2011.

Opinion on other matter as required by BEIS grant letter

In our opinion, in all material aspects, the core grant payments received from the Department for Business, Energy and Industrial Strategy (BEIS) has been applied for the purposes set out in the Grant Letter and in accordance with the terms and conditions of the core grant.

Matters on which we are required to report by exception

We have nothing to report in respect of the following matters where the Charities Act 2011 requires us to report to you if, in our opinion:

- the information given in the Trustees' report is inconsistent in any material respect with the financial statements; or
- sufficient accounting records have not been kept; or
- the parent charity financial statements are not in agreement with the accounting records and returns; or
- we have not received all the information and explanations we require for our audit.

BDO LLP

Fiona Condon (Senior Statutory Auditor)

For and on behalf of:

BDO LLP

Statutory Auditor

Gatwick

4 July 2017

BDO LLP is a limited liability partnership registered in England and Wales (with registered number OC305127).

Consolidated statement of financial activities

(Incorporating an income and expenditure account)

For the year ended 31 March 2017

	Notes	Unrestricted funds £'000	Restricted funds £'000	Expendable endowment funds £'000	Permanent endowment funds £'000	2017 Total funds £'000	2016 Total funds £'000
Income and endowments from donations and legacies	1	645	1,275	1,000	250	3,170	3,584
Income from charitable activities							
Grants for charitable activities	4	992	63,861	–	–	64,853	58,081
Trading in furtherance of charitable activities	3	9,902	382	–	–	10,284	8,987
		10,894	64,243	–	–	75,137	67,068
Other trading activities	3	1,535	–	–	–	1,535	1,710
Income from investments	2	1,082	787	785	2,574	5,228	5,294
Other income	5	5	95	–	–	100	54
Total income		14,161	66,400	1,785	2,824	85,170	77,710
Expenditure on raising funds	6	3,317	498	84	276	4,175	4,121
Expenditure on charitable activities							
Promoting science and its benefits		76	398	–	–	474	906
Recognising excellence in science		71	–	–	–	71	126
Supporting outstanding science		9,083	50,400	–	–	59,483	52,233
Providing scientific advice for policy		1,663	1,999	–	–	3,662	2,374
Fostering international and global cooperation		679	14,343	–	–	15,022	12,663
Education and public engagement		2,730	1,650	–	–	4,380	5,099
		14,302	68,790	–	–	83,092	73,401
Total expenditure		17,619	69,288	84	276	87,267	77,522

	Notes	Unrestricted funds £'000	Restricted funds £'000	Expendable endowment funds £'000	Permanent endowment funds £'000	2017 Total funds £'000	2016 Total funds £'000
Net (expenditure)/ income before net gains/(losses) on investments		(3,458)	(2,888)	1,701	2,548	(2,097)	188
Net gains/(losses) on investments	18	7,847	6,671	5,846	20,189	40,553	(10,748)
Net income/(expenditure) for the year		4,389	3,783	7,547	22,737	38,456	(10,560)
Gross transfers between funds	24	557	3,477	(1,231)	(2,803)	–	–
Actuarial (losses)/gains on defined benefit pension scheme	26	(1,602)	–	–	–	(1,602)	1,700
Net movement in funds		3,344	7,260	6,316	19,934	36,854	(8,860)
Total funds brought forward		83,779	41,658	28,836	102,139	256,412	265,272
Transfers between funds on conversion to a total return accounting approach	24	(1,770)	(5,939)	2,716	4,993	–	–
Total funds brought forward after transfers between funds		82,009	35,719	31,552	107,132	256,412	–
Total funds carried forward		85,353	42,979	37,868	127,066	293,266	256,412

All of the above results are derived from continuing activities. There are no other gains or losses other than those stated above.

The Charity's income for the year of £83,631,000 (2016: £75,998,000) less expenditure of £85,086,000 (2016: £74,515,000) led to a deficit of £1,454,000 (2016 surplus: £1,485,000). All income and expenditure and resulting net movements in funds are derived from continuing activities.

The notes that follow form part of the financial statements.

Consolidated balance sheet

As at 31 March 2017

	Notes	Group 2017 £'000	Group 2016 £'000	Charity 2017 £'000	Charity 2016 £'000
Fixed assets					
Tangible assets	15	15,335	15,904	15,335	15,904
Heritage assets	17	49,300	49,277	49,300	49,277
Investments	18	243,864	200,099	243,864	200,099
		308,499	265,280	308,499	265,280
Current assets					
Stocks	21	44	42	25	21
Debtors receivable within one year	19	6,620	6,338	7,053	6,798
Debtors receivable after one year	19	250	1,000	250	1,000
Cash at bank and in hand	21	2,654	4,049	2,268	3,281
		9,568	11,429	9,596	11,100
Creditors: amounts falling due within one year	20	(14,536)	(11,633)	(13,978)	(10,821)
Net current (liabilities) / assets		(4,968)	(204)	(4,382)	279
Total assets less current liabilities		303,531	265,076	304,117	265,559
Creditors: amounts falling due after more than one year	20	(192)	(51)	(192)	(51)
Net assets before pension scheme liability		303,339	265,025	303,925	265,508
Defined benefit pension scheme liability	26	(10,073)	(8,613)	(10,073)	(8,613)
Total net assets		293,266	256,412	293,852	256,895
Permanent endowment funds	24	127,066	102,139	127,066	102,139
Expendable endowment funds	24	37,868	28,836	37,868	28,836
Restricted funds	24	42,979	41,658	42,979	41,658
Unrestricted Funds					
Revaluation reserve	24	47,856	47,856	47,856	47,856
Defined benefit pension reserve	24	(10,073)	(8,613)	(10,073)	(8,613)
Unrestricted income funds	24	47,570	44,536	48,156	45,019
Total funds		293,266	256,412	293,852	256,895

Implementation of total return on investment for endowment funds has resulted in a current year transfer between funds. Further details relating to these transfers is set out in note 24.

The financial statements were approved and authorised for issue by Council on 4 July 2017 and signed on its behalf by



Professor Anthony Cheetham
Treasurer

Consolidated statement of cash flows

For the year ended 31 March 2017

	Notes	2017 £'000	2017 £'000	2016 £'000
Net cash used in operating activities	A		(2,547)	(3,073)
Cash flows from investing activities:				
Investment income		5,150		5,294
Purchase of tangible fixed assets	15	(1,140)		(1,022)
Purchase of heritage assets	17	(14)		(56)
Purchase of investments	18	(42,100)		(20,047)
Proceeds from sale of investments	18	38,006		20,274
Net cash (used in)/ provided by investment activities			(98)	4,443
Cash flows from financing activities:				
Receipt of endowment		1,250		240
Net cash provided by financing activities			1,250	240
(Decrease)/ Increase in cash and cash equivalents			(1,395)	1,610
Cash and cash equivalents at 1 April			4,049	2,439
Cash and cash equivalents at 31 March			2,654	4,049

A. Reconciliation of net income/ (expenditure) to net cash flow from operating activities

	Notes	2017 £'000	2016 £'000
Net income/ (expenditure) as per the statement of financial activities		38,456	(10,560)
Adjustments for:			
Depreciation charges	15	1,695	1,732
Losses/ (gains) on investments	18	(40,553)	10,748
Investment income	2	(5,228)	(5,294)
Loss on the disposal of fixed assets	15	16	17
Investment management fees charged to portfolio	18	958	785
Decrease/ (increase) in stocks	21	(2)	2
(Increase)/ decrease in debtors	19	468	(211)
Increase in creditors	20	3,044	315
Donated heritage assets	17	(9)	(15)
Increase in endowment investments		(1,250)	(240)
Difference between pension charge and cash contributions	26	(142)	(352)
Net cash (used in) operating activities		(2,547)	(3,073)

Accounting policies

For the year ended 31 March 2017

The principal accounting policies adopted in the preparation of these financial statements are as follows:

Accounting convention

The financial statements have been prepared in accordance with the Statement of Recommended Practice: Accounting and Reporting by Charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102) issued on 16 July 2014 and the Financial Reporting Standard applicable in the United Kingdom and Republic of Ireland (FRS 102) and the Charities Act 2011 and UK Generally Accepted Practice as it applies from 1 January 2015, and the Companies Act 2006.

Assets and liabilities are initially recognised at historical cost or transaction value unless otherwise stated in the relevant accounting policy or note.

These financial statements consolidate the results of the Royal Society and its active wholly-owned subsidiary, Royal Society Trading Limited on a line by line basis. Transactions and balances between the Charity and its subsidiary have been eliminated from the consolidated financial statements. Balances between the entities are disclosed in the notes of the Society's balance sheet. A separate statement of financial activities for the Charity itself is not presented.

The Charity meets the definition of a qualifying entity under FRS 102 and has therefore taken advantage of the disclosure exemption in relation to presentation of a cash flow statement in respect of its separate financial statements, which are presented alongside the consolidated financial statements.

The Royal Society is a Public Benefit Entity under FRS 102.

Critical accounting judgements and key sources of estimation uncertainty

In the application of the Group's accounting policies the Trustees are required to make judgements, estimates and assumptions about the carrying amounts of assets and liabilities that are not readily apparent from other sources. The estimates and associated assumptions are based on historical experience and other factors that are considered to be relevant. Actual results may differ from these estimates.

The estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognised in the period in which the estimate is revised if the revision affects only that period, or in the period of the revision and future periods if the revision affects both current and future periods.

Critical judgements include income recognition, cost allocation, and actuarial assumptions relating to the defined benefit pension scheme.

Income recognition

Income is allocated in accordance with the policy set out below, in particular, grants are recognised as receivable when all conditions for receipt have been complied with. Where donor-imposed restrictions apply to the timing of the related expenditure as a precondition of its use, the grant is treated as deferred income until those restrictions are met.

Cost allocation

Non-direct costs are allocated or apportioned to the expenditure categories on the SOFA using departmental salary costs as a base, which is considered the most appropriate basis for allocating these costs.

Defined benefit pension scheme

The cost of the defined benefit pension scheme, and the value of the present value of the scheme liability depend on a number of factors including assumptions about inflation, discount rates and mortality which are taken by actuarial specialists. The valuation of the scheme is particularly sensitive to discount rate assumptions, with a 0.1% movement in the discount rate resulting in a £1.2m change in the value of the scheme liabilities.

Fund accounting

Unrestricted funds comprise accumulated surpluses and deficits on general funds that are available for use at the discretion of the trustees in furtherance of the general objectives of the Charity.

Restricted and endowment funds are subject to specific restrictions imposed by the donor.

Transfers between funds may arise when there is a charge from unrestricted funds to other funds or there is a release of restricted funds to unrestricted funds.

Income

Donated goods and services are included at the value to the Society where these can be quantified. No amounts are included in these financial statements for the services donated by volunteers or Fellows.

Income from trading in subsidiary undertakings is transferred to the Society by gift aiding the profits of those undertakings.

Donations are accounted for as soon as their amount and receipt is certain. Donations include Gift Aid based on amounts recoverable at the accounting date.

Legacy income is recognised on a receivable basis when there is sufficient evidence to provide necessary probability that it will be received and the value of the incoming resources can be measured with sufficient reliability.

Fellows' annual contributions are recognised in the year in which they become due.

Investment income and interest on deposits is recognised on an accruals basis. Investment income arising on endowment funds is credited to the appropriate fund in accordance with the prescribed conditions.

Grants are credited as income in the year in which they are receivable. Grants are recognised as receivable when all conditions for receipt have been complied with. Where donor-imposed restrictions apply to the timing of the related expenditure as a precondition of its use the grant is treated as deferred income until those restrictions are met. Grants received for specific purposes are accounted for as restricted funds.

Expenditure

Expenditure, including irrecoverable VAT, is accounted for on an accruals basis. Expenditure is allocated to the particular activity where the cost relates directly to that activity. However, the cost of the overall direction and administration of the charity, comprising salary and overhead costs, is apportioned, based on the costs of staff engaged in direct activities.

Charitable expenditure includes all expenditure incurred on grants awarded and on other schemes run in pursuance of the Society's objectives under its Charter, including Fellowship activities and primary purpose trading. The Society adopted a five year strategy in 2012 and the charitable activities of the Society have been reported under the six main strategic objectives.

Costs of raising funds include those costs incurred in raising donations and legacies.

The direct costs of supporting these activities, including staff and other overhead costs, are separately analysed and shown as support costs under this heading.

Governance costs are incurred in relation to the running of the Society. These include the costs of strategic planning and attending to the Society's statutory affairs. Support services and governance costs are allocated on a pro-rata basis using departmental salary costs as a base.

Grants are recognised as a liability when the Society is under a legal or constructive obligation to make a transfer to a third party. As the Society retains the discretion to terminate grants only the grant expenditure in the current financial year is recognised in the financial statements. Grant commitments in future periods are treated as liabilities of those periods and not as liabilities at the balance sheet date. Such grants are disclosed as future commitments.

Foreign currency

Transactions in foreign currencies are translated into sterling using a weekly rate of exchange ruling at the date of the transaction. Assets and liabilities in foreign currency are translated into sterling at the rate of exchange ruling on the balance sheet date.

Leased assets

All operating leases and rental expenses are charged to the statement of financial activities as incurred over the term of the lease on a straight line basis.

Tangible fixed assets

Expenditure on tangible fixed assets is capitalised if the cost of the total asset exceeds £5,000. Additions of smaller value may be capitalised if forming part of a larger asset. The cost of other items is written off as incurred.

Depreciation is calculated on all assets, excluding freehold land and assets under development, to write off the cost of tangible fixed assets on a straight-line basis over their expected useful lives as follows:

Freehold property and improvements:	20 – 50 years
Freehold fixtures and fittings:	3 – 10 years
Leasehold improvements:	20 – 30 years
Leasehold fixtures and fittings:	3 – 10 years
Computers and AV equipment:	3 – 5 years
Other equipment:	10 – 20 years

Fixed assets are subject to review for impairment when there is an indication of a reduction in their carrying value. Any impairment is recognised in the statement of financial activities in the year in which it occurs.

Heritage assets

Heritage assets comprise:

- Printed books
- Archives
- Pictures
- Sculptures and other works of art
- Other artefacts

Printed books and archives are included on the balance sheet at cost using a valuation performed in 2003 as a proxy for cost. Pictures, sculptures and other works of art, and other artefacts are included on the balance sheet on a valuation basis. The valuation reflects the fair market / replacement value.

Impairment reviews are carried out at the end of each reporting period to ensure that the carrying value of the heritage assets reflect their carrying amounts.

Additions to heritage assets are made by purchase or donation. Purchases are initially recorded at cost and donations are recorded at a current value where available. The cost of obtaining an annual value outweighs the value of any resultant benefit. The Society holds and retains these assets as a long-term policy for use in its charitable purposes and has no intention of disposing of any of these items.

The Trustees do not consider that reliable cost or valuation information can be obtained for a large part of the archives collection and the Society does not therefore recognise these assets on its balance sheet. The Society was founded in 1660 and the collection has been built up throughout its existence. Reliable and relevant information on the cost of many of the assets is therefore not readily available. The number of un-capitalised assets held in the collection is extensive and their nature diverse; accordingly efforts to obtain costs or values would be prohibitively expensive compared with any benefits arising from the exercise. Added to this, there is a lack of comparable market values. Therefore any value attributed to these assets would be purely speculative and of limited practical use.

Investments

Investments listed on a recognised stock exchange, including Investment and Unit Trusts, are stated at bid price at the balance sheet date.

Net investment gains/ losses for the year are credited/ charged in the statement of financial activities. Unlisted investments comprise directly held investments and Private Equity and Venture Capital funds managed by third party investment fund managers. These investments are held at fair value (market value) in accordance with the International Private Equity and Venture Capital Valuation Guidelines. Where a reliable estimate of fair value is not available investments are held at cost. Investments held at cost are reviewed annually for impairment. No adjustment for impairment of the value of unlisted investments was considered necessary in the year.

Investment management fees are charged proportionally against the funds under investment. The investments in subsidiary undertakings are held at cost on the Society's balance sheet.

Total Return Accounting

On 23 March 2016, Council passed a resolution under Section 104A(2) of the Charities Act 2011 to adopt the use of total return in relation to its permanent endowments with the exception of the Theo Murphy Australia Fund.

This permits the Trustees to invest permanent endowments to maximise total return and to make available an appropriate portion of total return for expenditure each year. The Trustees have decided that it is in the interests of The Royal Society to present its expendable endowment in the same manner, although there is no legal restriction on the power to distribute the expendable endowment.

The trustees have used the values of the permanent endowments at 31 March 2012 to represent the 'Preserved Value' of the original gift.

The Trustees policy is to distribute 4% of the rolling 5 year average capital value of the fund. In determining that the Charity should adopt a total return approach, the trustees considered the Charities (Total Return) Regulations 2013, and received advice from Stone King LLP and Cazenove Capital Investment Managers.

The core endowment represents the part of the assets which the trustees seek to maintain in real terms. It is based on the value of the endowments at 31 March 2012 (restated value), together with an allowance for inflation (UK CPI as determined by the Office for National Statistics).

Financial instruments

Financial assets and financial liabilities are recognised when the charity becomes a party to the contractual provisions of the instrument. All financial assets and liabilities are initially measured at transaction price (including transaction costs). With the exception of fixed asset investments, basic financial instruments are initially recognised at transaction value and subsequently measured at their settlement value.

Trade and other debtors are recognised at the settlement amount due after any discount offered and net of the bad debt provision. Prepayments are valued at the amount prepaid net of any trade discounts due. Creditors and provisions are recognised where the company has a present obligation resulting from a past event that will probably result in the transfer of funds to a third party and the amount due to settle the obligation can be measured or estimated reliably. Creditors and provisions are normally recognised at their settlement amount after allowing for any trade discounts due.

Pension costs

The Society contributes to three pension schemes on behalf of its employees: the Pension and Life Assurance Plan of the Royal Society, a defined benefit scheme; the Universities Superannuation Scheme (USS), a defined benefit scheme; and the Royal Society Group Personal Pension Plan, a defined contribution scheme.

The assets of the Pension and Life Assurance Plan of the Royal Society scheme are held separately from those of the Society in separate trustee-administered funds. Pension Scheme assets are measured at fair value and liabilities on an actuarial basis using the projected unit method and discounted at a rate equivalent to the current rate of return on a high-quality corporate bond of equivalent currency and term to the Scheme liabilities. The actuarial valuations are obtained triennially and updated under FRS 102 rules at each balance sheet date. Any surplus or deficit is shown in the balance sheet as an asset or liability.

The charge to the statement of financial activities is calculated so as to spread the cost of pensions over employees' working lives with the Society. The charge comprises the administration costs of running the scheme, the current service cost computed by the actuary under FRS 102 and gains and losses on settlements and curtailments. Past service costs/ credits are recognised immediately if the benefits have vested. If the benefits have not vested immediately, the costs are recognised over the period until vesting occurs. The interest on the assets and liabilities for the period are shown as a net amount of other finance costs or credits charged or credited to the statement of financial activities. Actuarial gains and losses are recognised immediately under the description 'Actuarial losses on defined benefits pension scheme'.

USS is a multi-employer scheme and it is not possible to identify the Society's share of the underlying assets and liabilities. As required by FRS 102, the contributions are charged directly to the income and expenditure account as if it was a defined contribution scheme.

USS is a "last man standing" scheme which means that in the event that another member institution becomes insolvent the other participating members will pick up any funding shortfall. Further details about USS information about the latest informal valuations of the scheme and proposed rule changes can be found at www.uss.co.uk.

The defined contribution scheme came into existence on 1 October 2013 and is open to all employees. The pension charge in relation to this scheme is based upon employer's contributions payable in the year.

The method for allocation of pension costs between funds is to allocate on a pro-rata basis using departmental salary costs as a base.

Taxation

The Society is a charity within the meaning of Paragraph 1, Schedule 6 of the Finance Act 2010. Accordingly, the Charity is potentially exempt from taxation in respect of income or capital gains within categories covered by Chapter 3 of Part 11 of the Corporation Tax Act 2010 or Section 256 of the Taxation of Chargeable Gains Act 1992, to the extent that such income or gains are applied exclusively to charitable purposes.

No tax charge arose in the period.

Prior year comparatives

In accordance with FRS 102, prior year comparative figures for the following can be found as follows:

- Consolidated statement of financial activities – Note 28
- Analysis of net assets between funds – Note 29
- Movements on trust and specific funds in year – Note 30

Notes to the financial statements

For the year ended 31 March 2017

1. Income and endowments from donations and legacies						
	Unrestricted funds £'000	Restricted funds £'000	Expendable endowment funds £'000	Permanent endowment funds £'000	2017 Total funds £'000	2016 Total funds £'000
Gifts and donations	89	436	1,000	–	1,525	205
Legacies	391	839	–	250	1,480	3,156
Fellows' contributions	165	–	–	–	165	223
Total	645	1,275	1,000	250	3,170	3,584

2. Income from investments						
	Unrestricted funds £'000	Restricted funds £'000	Expendable endowment funds £'000	Permanent endowment funds £'000	2017 Total funds £'000	2016 Total funds £'000
Dividends – UK equities	629	390	663	1,932	3,614	3,547
Dividends – Overseas equities	358	179	122	642	1,301	1,430
Interest – UK fixed interest securities	24	65	–	–	89	135
Interest – Overseas fixed interest securities	52	138	–	–	190	146
Bank deposit interest	19	15	–	–	34	36
Total	1,082	787	785	2,574	5,228	5,294

3. Trading						
	External income £'000	Recharged internal lettings £'000	Gross expenditure £'000	2017 net surplus/ (deficit) £'000	2016 net surplus/ (deficit) £'000	
Other trading activities						
Lettings through subsidiary – Kavli Royal Society International Centre	1,535	545	(2,177)	(97)	(20)	
Trading in furtherance of charitable activities						
Publishing	6,851	–	(2,888)	3,963	3,635	
Lettings in furtherance of objectives – Carlton House Terrace	3,024	1,335	(2,789)	1,570	1,104	
Other	409	–	–	409	285	
	10,284	1,335	(5,677)	5,942	5,024	
Total	11,819	1,880	(7,854)	5,845	5,004	

The costs of the Society's publishing operation and the costs associated with the lettings in furtherance of charitable objects are included in "Supporting outstanding science" on the face of the statement of financial activities. The costs of lettings through the subsidiary are included in expenditure on raising funds.

The Society was exempt from income tax, corporation tax and capital gains tax on income derived from its primary purpose trading and charitable activities.

4. Grants for charitable activities

	Unrestricted funds £'000	Restricted funds £'000	Expendable endowment funds £'000	Permanent endowment funds £'000	2017 Total funds £'000	2016 Total funds £'000
From Government and other public bodies						
Grant from the Department for Business, Energy and Industrial Strategy	992	46,229	–	–	47,221	47,101
Department for International Development	–	2,505	–	–	2,505	1,757
BEIS Newton fund	–	5,510	–	–	5,510	4,044
BEIS Global Challenges Research Fund	–	4,778	–	–	4,778	–
Other grants from government and public bodies	–	118	–	–	118	215
From other external bodies						
Contribution to charitable activities	–	4,721	–	–	4,721	4,964
Total	992	63,861	–	–	64,853	58,081

Details of the income to and movement of individual funds are disclosed in note 23.

5. Other income

	Unrestricted funds £'000	Restricted funds £'000	Expendable endowment funds £'000	Permanent endowment funds £'000	2017 Total funds £'000	2016 Total funds £'000
Other Income	5	95	–	–	100	54
Total	5	95	–	–	100	54

6. Expenditure on raising funds

	Unrestricted funds £'000	Restricted funds £'000	Expendable endowment funds £'000	Permanent endowment funds £'000	2017 Total funds £'000	2016 Total funds £'000
Direct costs on raising funds	525	–	–	–	525	516
Support costs on raising funds	482	27	–	–	509	638
Cost of trading	2,183	–	–	–	2,183	2,182
Investment management fees	127	471	84	276	958	785
Total	3,317	498	84	276	4,175	4,121

7. Expenditure on charitable activities

	Staff costs £'000	Grant costs £'000 (Note 10)	Other direct costs £'000	Support costs £'000 (Note 8)	2017 Total £'000	2016 Restated total £'000
Charitable activities						
Promoting science and its benefits	8	304	152	10	474	906
Recognising excellence in science	–	–	71	–	71	126
Supporting outstanding science	2,950	47,832	5,186	3,515	59,483	52,233
Providing scientific advice for policy	1,481	–	432	1,749	3,662	2,374
Fostering international and global cooperation	545	12,831	1,003	643	15,022	12,663
Education and public engagement	1,265	204	1,416	1,495	4,380	5,099
Total for costs of charitable activities	6,249	61,171	8,260	7,412	83,092	73,401

8. Support costs

	Media relations and public engagement £'000	Facilities and building management £'000	Support services £'000	Governance £'000	2017 Total £'000	2016 Total £'000
Support costs on raising funds	35	133	310	31	509	638
Charitable activities						
Promoting science and its benefits	1	2	6	1	10	215
Recognising excellence in science	–	–	–	–	–	–
Supporting outstanding science	226	857	2,235	197	3,515	3,649
Providing scientific advice for policy	113	430	1,107	99	1,749	1,304
Fostering international and global cooperation	42	158	407	36	643	943
Education and public engagement	97	367	946	85	1,495	2,045
Total support costs	514	1,947	5,011	449	7,921	8,794

Facilities and building management comprises the rent and running costs (depreciation, insurance, cleaning and security) of Carlton House Terrace.

Support services comprises Finance, IT, HR, pension costs and Corporate Management.

Support costs are allocated on a pro-rata basis using departmental salary costs as a base.

9. Staff costs

	2017 £'000	2016 £'000
Costs by type		
Salaries	8,223	7,347
Social Security costs	807	667
Pension costs	1,078	(78)
Total	10,108	7,936

As required by FRS102, included in 2017 staff costs is an amount of £223,000 (2016: £76,000) relating to holiday pay owed to staff at 31 March 2017.

Pension costs include Employer contributions two Royal Society pension schemes, a defined contribution scheme and a defined benefit scheme, and the USS pension scheme as follows:

- The Royal Society Group Personal Pension Plan (defined contribution): £285,000 (2016: £184,000)
- The Pension and Life Assurance Plan of the Royal Society (defined benefit): £294,000 (2016: £374,000)
- USS: £93,000 (2016: £79,000)

These costs are net of a service credit arising as a result of the changes to Plan benefits during the previous financial year. Detailed information is provided in note 26.

The following numbers of employees of the Royal Society earning £60,000 per annum or more received total emoluments within the bands shown:

	2017	2016
£60,001 – £70,000	6	2
£70,001 – £80,000	3	7
£80,001 – £90,000	1	–
£90,001 – £100,000	1	2
£100,001 – £110,000	1	3
£110,001 – £120,000	1	2
£120,001 – £130,000	1	–
£130,001 – £140,000	–	1
£140,001 – £150,000	1	–
£150,001 – £160,000	1	–
£160,001 – £170,000	–	1
£200,001 – £210,000	–	–
£230,001 – £240,000	–	–
£280,001 – £290,000	–	1
£290,001 – £300,000	1	–

Of the above 17 (2016: 19) employees earning £60,000 per annum or more, 10 are key management personnel (2016: 13), with total remuneration of £1,448,000 including employer's NIC (2016: £1,577,000).

9. Staff costs (continued)

The average number of employees, analysed by function, was:

	2017	2016
Raising funds	7	7
Charitable activities	124	113
Support (including governance)	36	43
Total	167	163

The average full time equivalent was 165.6 (2016: 162).

Redundancy and termination payments were made to 2 employees during the year (2016: 6). Total redundancy and termination payments in respect of these employees were £79,000 (2016: £403,000).

10. Grants				
	Grants to institutions £'000	Grants to individuals £'000	2017 Total £'000	2016 Total £'000
Fellowships				
University Research Fellowships	–	25,634	25,634	25,477
Dorothy Hodgkin Fellowships	–	2,682	2,682	2,339
Newton Advanced Fellowships	–	3,534	3,534	3,052
Newton International Fellowships	–	3,746	3,746	2,522
RS Challenge Grants	–	3,451	3,451	–
Professorship of Public Engagement	–	36	36	36
Wolfson Research Merit Award	2,931	–	2,931	3,199
Leverhulme Trust Senior Research Fellowships	–	330	330	307
Royal Society Research Professorships	–	5,958	5,958	6,346
Industry Fellowships	–	1,305	1,305	1,530
RS Visiting Research Professorship	–	680	680	–
International Fellowship Grants	–	213	213	188
Sir Henry Dale Fellowships	–	2,900	2,900	2,200
Education Schemes				
Education Research Fellowships	–	–	–	30
Partnership grants scheme	86	–	86	90
Other Education grants	–	20	20	121
Other Grant Programmes				
Australian Academy of Science Think Tank	–	302	302	159
Brian Mercer Awards	–	304	304	200
Commonwealth Science	–	172	172	51
Paul Instrument Fund	–	151	151	112
Awards and prizes	40	322	362	202
Leverhulme Royal Society Africa Awards	–	–	–	652
Leverhulme Trust Senior Research Fellowships	–	412	412	–
Royal Society Africa Awards	–	–	–	–
Newton International Exchanges	–	590	590	640
India-UK Scientific Seminars	–	–	–	(18)
International Exchanges	–	1,766	1,766	1,501
DFID Africa Awards	–	2,319	2,319	1,433
Athena SWAN Charter Award	–	–	–	20
DAIWA joint projects	–	–	–	29
Royal Society Africa Exchanges	–	68	68	33
Foundation for Science and Technology	25	–	25	36
International Council for Scientific Unions	–	–	–	25
South Africa Seminars	–	–	–	(6)
Kavli Scientific Seminars	–	20	20	91
Wolfson Laboratory Refurbishment Grants	1,172	–	1,172	862
Other	2	–	2	–
Total	4,256	56,915	61,171	53,459

10. Grants (continued)

	Number	2017 Total £'000	2016 Total £'000
Recipients of institutional grants			
University of Cambridge	12	388	429
University of Leeds	15	336	377
Imperial College London	17	272	244
University of Glasgow	13	269	215
University of Oxford	18	236	196
University College London	20	201	179
University of Warwick	17	180	179
University of Southampton	19	177	175
University of Nottingham	9	164	163
University of Bristol	16	144	131
University of Manchester	13	137	124
University of Edinburgh	13	129	118
University of St Andrews	10	116	115
University of Birmingham	9	95	111
University of York	6	83	96
University of Exeter	10	82	92
University of Bath	7	75	90
University of Leicester	6	72	87
King's College London	4	64	84
University of Durham	5	58	75
University of Surrey	5	51	61
Institute of Cancer Research	2	35	51
Other	105	892	840
Total	351	4,256	4,232

Grants are generally awarded to particular individuals, although the actual award is made to the host organisation.

Details of individual grants awarded during the year analysed by organisation are available from the Finance Department on request.

11. Reconciliation of grants payable

	2017 Total £'000	2016 Total £'000
Liability at 1 April	1,473	1,323
New grants awarded in year	62,463	54,858
Grants paid in year	(61,763)	(53,310)
Grants refunded to the Society	(1,291)	(1,398)
Liability at 31 March	882	1,473

All grants payable fall due within one year.

12. Payments to Trustees and Related Party Transactions

	2017 Total £'000	2016 Total £'000
Remuneration	–	–
Expenses: Travel and subsistence	115	103

Expenses were reimbursed to or paid on behalf of 21 Trustees (2016: 24 Trustees).

Indemnity insurance

With the consent of the Charity Commission, the Society has taken out Trustees' indemnity insurance. The cost of this insurance for the year was £8,000 (2016: £3,000). No claims have been made under this policy.

Grants and awards

Professor Michael Cates FRSE FRS is a holder of a Royal Society Research Professorship. The amount paid to the University of Cambridge in respect of the award in the year was £160,000 (2016: £41,000 University of Edinburgh, £118,000 University of Cambridge).

Professor Jean Beggs CBE FRSE FRS was a holder of a Royal Society Research Professorship. The tenure ended at the end of last year and therefore the award in the year was £nil (2016: £61,000).

Professor Andrea Brand FMedSci FRS is a holder of a Royal Society Research Professorship. The amount paid to the University of Cambridge in respect of the award in the year was £96,000 (2016: £nil).

Professor Richard Catlow FRS is currently a co-applicant on a Newton Fellowship Advanced Fellowship awarded to Professor Hasani Chauke. The total value of the award is £111,000. This was awarded and taken up before the 2016/17 financial year. The amount paid to University College London in 2017 was £37,000 (2016: £37,000).

Dame Wendy Hall DBE FREng FRS is currently a co-applicant on a Newton Advanced Fellowship awarded to Dr Jie Tang in the previous year and ongoing to 2018. Total value of award is £111,000. This awarded and taken up before the 2016/17 financial year. The amount paid to the University of Southampton in 2017 was £37,000 (2016: £37,000).

Other

Sir Venki Ramakrishnan, President of the Royal Society, has use of the President's flat at Carlton House Terrace.

Related party transactions

Dr Hermann Hauser is a partner of Amadeus Capital Partners Limited. The Society has entered into a Limited Partnership Agreement with Amadeus to manage and administer the Enterprise Fund, a restricted fund of the Society which invests in early-stage science-based companies. Amadeus Capital Partners received £251,000 in 2017 in relation to the operation of the fund (2016: £200,000).

The Royal Society had two wholly-owned trading subsidiaries during the year, Royal Society Trading Limited Registered Company number 06967016 and Royal Society (London) Ltd Registered Company number 08808518.

13. Total resources expended include the following amounts:

	2017 Total £'000	2016 Total £'000
Operating lease rentals		
Plant and machinery	48	26
Rent	490	490
	538	516
Fees payable to the Charity's auditors for:		
The audit of the Charity and Group accounts	31	32
The audit of the Charity's subsidiaries accounts	5	5
The audit of the Charity's pension scheme	3	7
Grant audits	1	3
(Over)/ under provisions for the prior year fees	(7)	(4)
Total audit fees	33	43
Charges on owned assets		
Depreciation	1,694	1,732
	1,694	1,732

14. Financial memoranda**Income and expenditure relating to government grants during the year was as follows:**

	2017 Total £'000	2016 Total £'000
Department for Business, Energy and Industrial Strategy		
Income	47,221	47,101
Expenditure	(47,221)	(47,101)
	–	–
Department for International Development grant		
Income	2,505	1,757
Expenditure	(2,512)	(1,757)
	(7)	–
BEIS Global Challenges Research Fund		
Income	4,778	–
Expenditure	(4,778)	–
	–	–

15. Tangible fixed assets – Group and Charity

	Chicheley Hall freehold and property improvement £'000	Chicheley Hall computers and other equipment £'000	Leasehold improvements £'000	Computers and other equipment £'000	Assets under development £'000	2017 £'000	2016 £'000
Cost							
At 1 April	17,550	687	19,631	3,023	443	41,334	42,376
Additions	41	–	30	237	832	1,140	1,022
Disposals	–	–	–	(331)	–	(331)	(2,062)
Transfers	2	35	197	146	(380)	–	–
At 31 March	17,593	722	19,858	3,075	895	42,143	41,336
Depreciation							
At 1 April	13,971	471	8,728	2,258	–	25,428	25,745
Charge for year	68	64	1,259	304	–	1,695	1,732
Disposals	–	–	–	(315)	–	(315)	(2,045)
At 31 March	14,039	535	9,987	2,247	–	26,808	25,432
Net book value at 31 March 2017	3,554	187	9,871	828	895	15,335	
Net book value at 31 March 2016	3,578	215	10,902	766	443		15,904

All tangible fixed assets are used for the support of charitable activities within the Society.

The Group and the charity have freehold property with a net book value of £3,555,000 (2016: £3,578,000).

16. Capital commitments – Group and Charity

	2017 £'000	2016 £'000
Authorised and contracted for	843	1,568
Authorised but not contracted for	979	1,341
Total Commitment	1,822	2,909

At the balance sheet date, £1,350,000 of capital commitments was authorised for refurbishment of 6 – 9 Carlton House Terrace, of which £471,000 has been contracted for by the year end. A further spend of £1,289,000 had been authorised on IT projects, of which £957,000 has been contracted for by the year end. £128,000 had been authorised for the historic maintenance of Chicheley Hall, of which £40,000 has been contracted for by the year end. Other general capital items total £142,000, of which £100,000 has been contracted for by the year end.

17. Heritage assets

The Society holds an extensive collection of heritage assets relating to the history of the Society itself and the wider history of scientific endeavour. The collection has four main components:

Printed works: The Library contains over 70,000 titles, published from the 1470s to the present day. The main strength of the collections is in the 17th and 18th centuries; from the 1680s to the mid-19th century, the policy of the Library was to acquire every important scientific publication.

Archives: These comprise an extraordinary and unrivalled record of the development of science that spans over 350 years. The archive collection is a unique resource for historians, particularly historians of science, containing over 250,000 items.

Pictures, sculptures, and other works of art: The collection includes over 6,000 photographs, engravings, and paintings of past and present Fellows.

Other artefacts: The collection comprises approximately 150 items and includes scientific instruments, furniture and furnishings, and the Society's Charter Book.

The collections are accessible to scholars and the wider public through the Royal Society's History of Science Centre, which includes a reference library and an extensive on-line presence, including fully searchable catalogue and image library.

Summary of heritage asset transactions

	Assets held at cost £'000	Assets held at valuation £'000	2017 £'000	2016 £'000
Purchases/donations				
At 1 April	36,181	13,096	49,277	49,206
Additions	14	9	23	71
Valuation or cost at 31 March	36,195	13,105	49,300	49,277

The heritage assets comprise:

Printed books			13,269	13,260
Archives			22,877	22,877
Pictures, sculptures and other works of art			9,383	9,369
Other artefacts			3,771	3,771
Total			49,300	49,277

The Printed Books and Archives were valued in August 2003 by Roger Gaskell, a rare book dealer and the pictures and other artefacts by Weller King, Fine Art Dealers, in May 2004. The valuations are on a fair market/ replacement basis on those parts of the collection where it is felt such a valuation can be reasonably made.

Assets are held at valuation as a proxy for cost.

The paintings and furniture at Chicheley Hall were valued in March 2015 by Weller King, Fine Art Dealers. The valuations are on a fair market/ replacement basis on those parts of the collection where it is felt such a valuation can be reasonably made. The trustees consider there to be no material impairment on the present market values/ replacement values compared to those stated.

17. Heritage assets (continued)**Five year financial summary of heritage asset transactions**

	2017 £'m	2016 £'m	2015 £'m	2014 £'m	2013 £'m
Purchases/donations					
Printed books	13	13	3	3	1
Archives	23	4	–	–	30
Pictures, sculptures and other works of art	9	54	–	19	–
Other artefacts	4	–	112	–	–
Total purchases/ donations	49	71	115	21	31

Donated heritage assets are recognised in the year they are received. There have been no disposals of heritage assets within the last five years.

Preservation and Management

Expenditure which in the Trustees' view is required to preserve or clearly prevent further deterioration of individual collection items is recognised in the Income and Expenditure account when it is incurred.

The Society has an ongoing cataloguing project and the Society's major strategic facilities for the long-term preservation of its historic archives, manuscripts and printed books are environmentally-controlled store rooms (conforming to British Standard 5454, 'Preservation of archival documents').

The Society's modern records have been subject to a full audit, completed in April 2011. This process enabled the full-life management, destruction and permanent archiving of pertinent files. Conservation of damaged items is now underway.

Each of the Society's major collections (archives, modern records, printed books, pictures, journals, objects) has a designated member of curatorial staff and exhibited materials are looked after by an exhibitions manager. Collections are managed and recorded in discrete databases and according to the prevailing standard in each area (for example, International Standard Archival Description (ISAD) for archival cataloguing, SPECTRUM for museum standards and picture control).

18. Investments		
	2017	2016
	£'000	£'000
Valuation at 1 April	200,099	211,859
Additions of investments	25,137	18,076
Disposal of investments	(37,555)	(19,833)
Net change in cash invested for trades within portfolio	12,097	1,605
Investment management costs	(958)	(785)
Net cash added to portfolio	4,866	366
Net unrealised gains/ (losses)	39,645	(11,243)
Exchange rate gains on valuation at 31 March	533	54
Valuation at 31 March	243,864	200,099
Total historical cost at the end of the year	153,808	153,640

The valuation at 31 March 2017 comprises:

Investments listed on a recognised stock exchange including investments and unit trusts:		
UK	106,422	102,933
Overseas	92,044	71,405
Other unlisted securities:		
UK	10,454	4,406
Overseas	7,718	8,131
Cash:		
UK	13,014	7,084
Overseas	14,212	6,140
Total	243,864	200,099

Overseas investments comprise equities, unit/investment trusts and fixed interest funds. Of the total investment portfolio £234,028,000 is invested purely to generate a financial return and £9,771,000 is mixed motive, made in part to generate a financial return as well as for the furtherance charitable objectives.

The Society owns 100% of the issued share capital of The Royal Society Trading Limited (note 27). The principal activity of the company is conferencing activities at Chicheley Hall.

The Society owns 100% of the issued share capital of the Royal Society (London) Ltd (note 27). No business activity was undertaken from the date of incorporation to 31 March 2017.

Funds are invested as follows:

	2017	2016
	£'000	£'000
Specific investments – Amadeus RSEF	9,771	7,634
Specific investments – Theo Murphy Australia Fund	3,915	3,155
Pooled investments	230,178	189,310
Total	243,864	200,099

Reconciliation of investment gains

Unrealised gains/ (losses)	39,565	(11,229)
Realised gains	454	427
Exchange rate gains on valuation	534	54
Net gains/ (losses) on investments as per statement of financial activities	40,553	(10,748)

19. Debtors

	2017 Receivable within one year £'000	2017 Receivable after one year £'000	2016 Receivable within one year £'000	2016 Receivable after one year £'000
Trade debtors	3,196	–	1,806	–
Grants receivable	750	250	750	1,000
Legacy receivable	704	–	2,325	–
Other debtors	10	–	125	–
Accrued income	1,219	–	989	–
Prepayments	741	–	343	–
Total	6,620	250	6,338	1,000

Included in the Group debtors are debtors of £135,000 (2016: £92,000) of Royal Society Trading Ltd. All other debtors relate to the Charity.

The Charity holds a loan in respect of the Royal Society Trading Ltd of £594,000 (2016: £647,000).

20. Creditors

	2017 Due within one year £'000	2017 Due after one year £'000	2016 Due within one year £'000	2016 Due after one year £'000
Trade creditors	1,538	–	1,209	–
Publications advanced sales	4,068	–	3,319	–
Chicheley advanced sales	163	–	206	–
Grants payable	882	–	1,472	–
Other creditors	626	30	391	51
Accruals and provisions	1,083	162	1,090	–
Deferred income	6,176	–	3,946	–
Total	14,536	192	11,633	51

Included in the Group creditors are creditors of £564,000 (2016: £764,000) relating to Royal Society Trading Ltd.

All other creditors relate to the Charity.

As at 31 March 2017, the charity owed Royal Society Trading Limited £70,000.

As required by FRS102, included within accruals and provisions 2017 is a provision for a liability under the deficit recovery plan for the Universities Superannuation Scheme (USS) multi-employer pension scheme. A total amount of £173,000 (2016: £184,000) has been provided for, comprising £11,000 (2016: £12,000) due within one year and £162,000 (2016: £173,000) due within more than one year.

This provision has been calculated using the modeller developed by the British Universities Finance Directors Group (BUFDG), with the support of the USS trustee company, to provide a tool for estimating the liability under the recovery plan for accounting purposes.

This is the only provision within accruals and provisions.

Reconciliation of deferred income

	2017 £'000	2016 £'000
Deferred income brought forward	3,946	4,294
Amount released from previous year	(3,946)	(4,294)
Incoming resources deferred in the year	6,176	3,946
Total	6,176	3,946

21. Other assets		
	2017 £'000	2016 £'000
Stock in hand		
Conference and catering	34	33
Bio fuel	10	9
Total	44	42
Cash at Bank		
Pounds Sterling	1,063	2,804
Foreign currency	1,591	1,245
Total	2,654	4,049

22. Statement of total returns			
	Expendable endowment £'000	Permanent endowment £'000	2017 Total £'000
Investment returns			
Investment Income	784	2,574	3,358
Capital gains	5,846	19,278	25,124
Investment management costs	(83)	(276)	(359)
Total return for year	6,547	21,576	28,123
Indexation	(618)	(2,028)	(2,646)
Less application of total return	(1,231)	(2,803)	(4,034)
Net total return for the year	4,698	16,745	21,443
Unapplied Total return			
At 1 April 2016	5,709	16,915	22,624
At 31 March 2017	10,407	33,660	44,067

On 23 March 2016, Council passed a resolution under Section 104A(2) of the Charities Act 2011 to adopt the use of total return in relation to its permanent endowments with the exception of the Theo Murphy Australia Fund. The trustees have decided that it is in the interests of The Royal Society to present its expendable endowment in the same manner, although there is no legal restriction on the power to distribute the expendable endowment.

23. Analysis of net assets between funds – Group

	Unrestricted funds £'000	Restricted funds £'000	Expendable endowment funds £'000	Permanent endowment funds £'000	2017 Total funds £'000	2016 Total funds £'000
Funds balances at 31 March 2017 are represented by:						
Tangible fixed assets	15,335	–	–	–	15,335	15,904
Heritage assets	49,300	–	–	–	49,300	49,277
Investments	35,951	42,979	37,868	127,066	243,864	200,099
Net current liabilities	(4,968)	–	–	–	(4,968)	(204)
Creditors: Due after one year	(192)	–	–	–	(192)	(51)
Defined benefit pension scheme liability	(10,073)	–	–	–	(10,073)	(8,613)
Net assets	85,353	42,979	37,868	127,066	293,266	256,412

The net current liabilities in 2017 are funded by investments, which could be realised to meet the net liabilities as they fall due.

24. Movements on Trust and specific funds in year – Group

Endowment Funds – Group – Brought Forward at 1 April 2016 (implementation of total return)

	Prior year b/f at 1 April 2016 £'000	Transfers between funds £'000	Total balance after transfers at 1 April 2016 £'000	Relevant value at 2012 £'000	New endowments since 2012 £'000	Indexation £'000	Relevant value b/f £'000	Unapplied total return at 1 April 2016 £'000	Total at 1 April 2016 £'000
Permanent endowment funds									
Life Sciences Trust	11,947	1,090	13,037	10,087	–	351	10,438	2,599	13,037
Maths and Physical Sciences Trust	10,959	999	11,958	9,253	–	322	9,575	2,383	11,958
RW Paul Instrument Fund	11,752	270	12,022	9,921	–	345	10,266	1,756	12,022
Theo Murphy – UK	56,325	2,134	58,459	47,555	–	1,655	49,210	9,249	58,459
Other Permanent Endowments	8,854	500	9,354	3,320	4,936	170	8,426	928	9,354
Total Permanent Endowments under Total Return	99,837	4,993	104,830	80,136	4,936	2,843	87,915	16,915	104,830
Other Permanent Endowments									
Theo Murphy – Australia			2,302	–	–	–	–	–	2,302
Total Permanent Endowments			107,132	80,136	4,936	2,843	87,915	16,915	107,132
Expendable Endowment Funds									
General Trust Fund	11,019	1,548	12,567	9,672	–	337	10,009	2,559	12,568
Life Sciences Trust	7,002	639	7,641	5,912	–	206	6,118	1,523	7,641
Maths and Physical Sciences Trust	3,814	347	4,161	3,219	–	112	3,331	830	4,161
Other Expendable funds	7,001	182	7,183	4,225	2,000	160	6,385	797	7,182
Total Expendable Endowments	28,836	2,716	31,552	23,028	2,000	815	25,843	5,709	31,552

The preserved value is the value of the endowments at 1 April 2012, which was £103,164,000.

Transfers between funds comprise unapplied investment income since 1 April 2012 which have been transferred to endowment funds on implementation of a total return accounting approach. Restricted funds that were present at 31 March 2012 have been maintained within restricted funds.

24. Movements on Trust and specific funds in year – Group (continued)

Endowment Funds – Group – Movements in year

	Relevant value b/f £'000	New endowments £'000	Indexation £'000	Relevant value c/f £'000	Unapplied total return at 1 April 2016 £'000	Income £'000	Investment gains £'000	Expenditure £'000	Indexation £'000	Transfers application of total return £'000	Unapplied total return at 31 March 2017 £'000	Total at 31 March 2017 £'000
Permanent endowment funds												
Life Sciences Trust	10,438	–	240	10,678	2,599	319	2,371	(34)	(240)	(484)	4,531	15,209
Maths and Physical Sciences Trust	9,575	–	220	9,795	2,383	295	2,202	(31)	(220)	(444)	4,185	13,980
RW Paul Instrument Fund	10,266	–	236	10,502	1,756	298	2,219	(34)	(236)	(213)	3,790	14,292
Theo Murphy – UK	49,210	–	1,132	50,342	9,249	1,431	10,758	(161)	(1,132)	(1,492)	18,653	68,995
Other Permanent Endowments	8,426	250	200	8,876	928	231	1,728	(16)	(200)	(170)	2,501	11,377
Total Permanent Endowments under Total Return	87,915	250	2,028	90,193	16,915	2,574	19,278	(276)	(2,028)	(2,803)	33,660	123,853
Other Permanent Endowments												
Theo Murphy – Australia	2,302	–	–	–	–	–	911	–	–	–	–	3,213
Total Permanent Endowments	90,217	250	2,028	90,193	16,915	2,574	20,189	(276)	(2,028)	(2,803)	33,660	127,066
Expendable Endowment Funds												
General Trust Fund	10,009	–	230	10,239	2,559	310	2,304	(31)	(230)	(466)	4,446	14,685
Life Sciences Trust	6,118	–	141	6,259	1,523	187	1,390	(20)	(141)	(284)	2,655	8,914
Maths and Physical Sciences Trust	3,331	–	77	3,408	830	103	766	(11)	(77)	(155)	1,456	4,864
Other Expendable funds	6,385	1,000	170	7,555	797	184	1,386	(21)	(170)	(326)	1,850	9,405
Total Expendable Endowments	25,843	1,000	618	27,461	5,709	784	5,846	(83)	(618)	(1,231)	10,407	37,868

Indexation has been applied using the annual CPI rate to March.

24. Movements on Trust and specific funds in year – Group (continued)

Restricted and unrestricted funds – Group

	Brought forward at 1 April 2016 £'000	Transfer of income to endowment funds £'000	Total endowments 31 March 2016 £'000	Income £'000	Investment and actuarial gain (loss) £'000	Expenses £'000	Transfers £'000	Carried forward at 31 March 2017 £'000
Restricted funds								
Life Sciences Trust	7,967	(1,729)	6,238	1,045	1,135	(1,635)	768	7,551
Maths and Physical Sciences Trust	7,338	(1,347)	5,991	161	1,103	(1,584)	599	6,270
Enterprise Fund	7,774	–	7,774	10	2,349	(362)	–	9,771
Other Restricted Funds	18,578	(2,863)	15,715	65,185	2,084	(65,707)	2,110	19,387
Total restricted funds	41,657	(5,939)	35,718	66,401	6,671	(69,288)	3,477	42,979
Unrestricted funds								
General Trust Fund	13,294	(1,770)	11,524	623	2,113	(617)	558	14,201
BEIS Science and Research	–	–	–	992	–	(992)	–	–
Revaluation Reserve	47,856	–	47,856	–	–	–	–	47,856
Defined Benefit Pension Reserve	(8,613)	–	(8,613)	–	(1,602)	142	–	(10,073)
General Purpose	31,242	–	31,242	12,553	5,734	(16,159)	(1)	33,369
Total unrestricted funds	83,779	(1,770)	82,009	14,168	6,245	(17,626)	557	85,353

Purposes of funds

The objects of the Life Sciences Fund are to promote and advance for the general benefit of the public, including the scientific (science, medicine, engineering and technology) community, the study and investigation of, and research into all areas of life sciences and other science at the interface between this area and other areas of science. This shall be done in particular by supporting scientists working in this area, advancing engagement of the public in all matters relating to such science and providing the best possible scientific advice and information to those making policy in the area of life science.

The objects of the Mathematics and Physical Sciences Fund are to promote and advance for the general benefit of the public, including the scientific (science, medicine, engineering and technology) community, the study and investigation of, and research into all areas of mathematics and physical sciences and other science at the interface between this area and other areas of science. This shall be done in particular by supporting scientists working in this area, advancing engagement of the public in all matters relating to such science and providing the best possible scientific advice and information to those making policy in the area of mathematics and physical science.

Following the Deed of retirement of the other trustees the property and investments of the RW Paul Instrument Fund were transferred to the sole remaining trustee being the Royal Society. The application of the income from the portfolio is restricted to the provision of grants under the Paul Instrument Grants Scheme.

The Theo Murphy Funds (in the UK and Australia) were created through a bequest from the estate of the late Theo Murphy. The funds “shall be used or applied to further scientific discovery in the fields of medicine, science, technology and engineering”. The Australia Fund will carry out activities in Australia in accordance with the will.

24. Movements on Trust and specific funds in year – Group (continued)

The objects of the General Fund are to promote and advance for the general benefit of the public, including the scientific (science, medicine, engineering and technology) community, the efficiency and effectiveness of the Royal Society and its Fellowship. This shall be done in particular by establishing, promoting, supporting and maintaining, for the general benefit of the public and the scientific community, its activities, premises, fixtures and fittings, equipment, libraries and archives, general publications and the history of science.

The Enterprise Fund was created by generous donations in support of the Society in making equity investments in innovative early-stage businesses emerging from the science base in the UK and elsewhere.

Other Restricted Funds comprise monies received to fund separate restricted projects in line with our charitable activities and are held as separate individual funds in our accounts.

The Society receives a grant from BEIS. This supports work on scientific excellence and innovation, science and mathematics education, international activities and science communication activities. £3,100,000 (2016: £2,900,000) of BEIS funding appears in transfers this year. This mainly comprises the £2,000,000 (2016: £2,000,000) contribution to Wolfson Research Merit Grants as described above as well as a £1,100,000 (2016: £1,000,000) contribution to Industry Fellowships.

The Revaluation Reserve relates to the revaluation of the heritage assets.

The Transfers between projects and funds include administration charges of the investments held in the trusts, administration costs reclaimed from projects where applicable, notional interest paid to projects in respect of income held during the year and any income released to the general reserves at the end of projects (where allowed under the gift or grant agreement).

25. Financial Commitments – Group and Charity

At 31 March 2017 the Society had the following commitments:

Total future minimum lease payments under a non-cancellable operating lease in respect of occupation of 6 – 9 Carlton House Terrace, London is as follows for each of the following periods:

	2017 £'000	2016 £'000
Less than one year	490	490
One to five years	1,960	1,960
Over five years	20,580	21,070
Total	23,030	23,520

The lease is due to expire on 5 January 2064 however the next 10 yearly rent review is due on 5 January 2025.

Agreements and commitments to fund research professorships / fellowships and other grants totalling £117,000,000 (2016: £120,000,000). Of these, £47,000,000 (2016: £47,000,000) are due in less than one year, and £70,000,000 (2016: £73,000,000) in between two and five years. There are no grants payable in more than 5 years. As the Society retains the discretion to terminate these grants they are treated as liabilities of future periods and will be financed by specific grants or other income receivable in those periods.

The Society has entered into investment contract commitments totalling £725,000 (2016: £724,000) payable at dates yet to be agreed.

26. Pension obligations – Group and Charity

The Royal Society (“the Employer”) operates a defined benefit pension arrangement in the UK called the **Pension and Life Assurance Plan of the Royal Society** (“the Plan”), with assets held in a separately administered fund. The Plan provides retirement benefits on the basis of members’ final salary. The Plan is closed to new members, although remains open to future benefit accrual, and provides benefits on a defined benefit basis.

The most recent valuation of the Plan under FRS102 was carried out as at 31 March 2017. The valuation of the Plan used the projected unit method and was carried out by Barnett Waddingham LLP, professionally qualified actuaries.

The FRS102 liability does not include any allowance for discretionary benefits. The Employer expects to make contributions to the Plan during the year to 31 March 2018 of around £1,242,000.

The Plan is subject to the Statutory Funding Objective under the Pensions Act 2004. A valuation of the Plan is carried out at least once every three years to determine whether the Statutory Funding Objective is met. As part of the process the Employer must agree with the trustees of the Scheme the contributions to be paid to address any shortfall against the Statutory Funding Objective and contributions to pay for future accrual of benefits.

The full actuarial valuation at 1 January 2016 showed a decrease in the deficit from £4,744,000 to £3,716,000. It has been agreed with the Trustees that the Employer will pay £358,500 on or before each 30 April and 31 October in the years 2016 to 2021 inclusive to meet the deficit.

Contributions payable by the Employer in respect of future benefit accrual and expenses are at the rate of 23.9% of Pensionable Salaries. Members’ contributions are 7% of Pensionable Salaries. Life cover and dependants’ pensions in respect of death in service are provided by additional insurance premiums.

The principal assumptions used to calculate Plan liabilities include:

	2017 % pa	2016 % pa
Inflation (RPI)	3.3	3.3
Inflation (CPI)	2.3	2.3
Salary escalation	2.0	2.0
Increase to pensions in payment* – subject to LPI minimum 4%	4.2	4.1
Increase to pensions in payment* – subject to LPI	3.2	3.3
Statutory revaluation	2.3	2.3
Discount rate (pre-and-post-retirement)	2.8	3.7
Pre-retirement mortality table	S2NA	S1NA
Post-retirement mortality table	S2NA	S1NA
Post-retirement mortality projection	CMI_2016 projections with LTR of 1.5% pa	CMI_2014 projections with LTR of 1.5% pa
Tax free cash	20% of pension	15% of pension
Withdrawals	None	None

*Pensions in payment increase by the lesser of the annual increase in the retail price index or 5%. For service prior to 1 November 2001 this is subject to a minimum increase of 4%.

26. Pension obligations – Group and Charity (continued)

Under the mortality tables and projections adopted, the assumed future life expectancy at age 60 is as follows:

	2017	2016
Male currently aged 40	29.1 years	29.8 years
Female currently aged 40	31.2 years	32.6 years
Male currently aged 60	27.2 years	27.5 years
Female currently aged 60	29.3 years	30.2 years

The assets in the Plan were:

	Value at 31 March 2017 £'000	Value at 31 March 2016 £'000
Equities	19,680	15,898
Index-linked gilts	8,680	7,247
Cash	502	124
Diversified growth	9,564	8,845
Annuity policies	6,627	7,186
Total market value of Plan assets	45,053	39,300
Present value of scheme liabilities	(55,126)	(47,913)
Net pension liability	(10,073)	(8,613)

The assets do not include any investment in shares of the Employer.

Reconciliation of present value of scheme liabilities

	Value at 31 March 2017 £'000	Value at 31 March 2016 £'000
Defined benefit obligation at 1 April	47,913	50,798
Current service cost	445	632
Contributions by Plan participants	168	190
Interest cost	1,754	1,704
Benefits paid	(1,191)	(1,567)
Change due to settlements or curtailments	–	–
Experience (gain)/loss on liabilities	(545)	(656)
Changes to demographic assumptions	(3,948)	–
Changes to financial assumptions	10,530	(3,188)
Defined benefit obligation at 31 March	55,126	47,913

26. Pension obligations – Group and Charity (continued)**Reconciliation of fair value of scheme assets**

	Value at 31 March 2017 £'000	Value at 31 March 2016 £'000
Fair value of scheme assets at 1 April	39,300	40,133
Interest on assets	1,452	1,364
Contributions by the Employer	1,176	1,524
Contributions by Scheme participants	168	190
Benefits paid	(1,191)	(1,567)
Administration costs	(287)	(200)
Return on Plan assets less interest	4,435	(2,144)
Fair value of scheme assets at 31 March	45,053	39,300

The actual return on Plan assets in the year was £5.89m (2016: (£0.78m)).

Analysis of the amount charged to the statement of financial activities – operations

	Value at 31 March 2017 £'000	Value at 31 March 2016 £'000
Current service cost	445	632
Administration costs	287	200
Interest cost	1,754	1,704
Interest on assets	(1,452)	(1,364)
Total charge	1,034	1,172

Actuarial gains and losses

	Value at 31 March 2017 £'000	Value at 31 March 2016 £'000
Losses/ (gains) on scheme assets in excess of interest	(4,435)	2,144
Experience gains on liabilities	(545)	(656)
Gains from changes to demographic assumptions	(3,948)	–
Losses (gains) from changes to financial assumptions	10,530	(3,188)
Actuarial losses/ (gains)	1,602	(1,700)

26. Pension obligations – Group and Charity (continued)

The Royal Society ("the Employer") operates two pension schemes and contributes to the Universities Superannuation Scheme (USS).

Three members of the Society's staff are active members of **USS**, a defined benefit scheme (2016: three members). During the year ended 31 March 2017, employer contributions to this scheme totalled £93,000 (2016: £79,000). The employer contribution rates at the year end was 18% (2016: 16%)

USS is a defined benefit scheme which is externally funded and valued every three years by professionally qualified independent actuaries using the Projected Unit Method. The scheme is a "last man standing" scheme which means that in the event that another member institution becomes insolvent the other participating members will pick up any funding shortfall.

At the date of the latest actuarial valuation of the scheme (31 March 2014), the assets were sufficient to cover 86% of the benefits that had accrued to members; the deficit at 31 March 2016 was £10.0bn (2015: £8.2bn). The triennial valuation as at 31 March 2017 is still pending.

Based on expected contributions until 31 March 2031, the net present value of the payment towards the reduction of the deficit is estimated using the modeller developed by the British Universities Finance Directors Group (BUFDG), with the support of the USS trustee company, as a tool for estimating the liability under the recovery plan for accounting purposes. An initial liability of £184,000 was charged to the Statement of Financial Activities during 2015/16 and recorded as a liability on the balance sheet to be unwound over time (initially over the period to 2031) as the liability is discharged; to 31 March 2017, £22,000 of this provision has been released. Further information can be found at www.uss.co.uk.

27. Subsidiary undertakings

The Society owns 100% of the £1 called-up and issued share capital of Royal Society Trading Limited, company number 06967016. Royal Society Trading Limited company has been set up to process the activities that occur at Chicheley Hall.

The Society also owns 100% of the £1 called-up and issued share capital of The Royal Society (London) Ltd, company number 08808518. The Royal Society (London) Ltd company was incorporated on 10 December 2013, has been set up to process certain trading activities that occur at Carlton House Terrace and has had no activity in the year.

	2017 £'000	2016 £'000
Results of Royal Society Trading Limited for the year ended 31 March 2017:		
Trading income		
Internal income	545	452
External income	1,535	1,709
Cost of sales	(2,126)	(2,118)
Gross (loss)/ profit	(46)	43
Administrative expenses	(45)	(51)
Operating loss	(91)	(8)
Interest on loan account to parent	(12)	(12)
Result for the period	(103)	(20)
Total funds brought forward at 1 April	(483)	(463)
Total funds carried forward at 31 March	(586)	(483)
Balance Sheet of Royal Society Trading Limited as at 31 March 2017:		
Current assets		
Stock	19	21
Debtors	167	140
Cash at bank and in hand	386	768
	572	929
Creditors: amounts falling due within one year	(1,158)	(1,412)
Net Current Liabilities	(586)	(483)
Capital and reserves		
Called up share capital	–	–
Profit and loss reserve	(586)	(483)
Shareholder's funds	(586)	(483)

Royal Society Trading Limited has called up share capital of £1.

Royal Society (Australia) Pty Limited ACN 126112678 is the Trustee of the Royal Society Theo Murphy (Australia) Fund. It is an Australian company the shares of which are owned by the Society.

28. Prior year comparison – Consolidated statement of financial activities

(Incorporating an income and expenditure account)

For the year ended 31 March 2016

	Unrestricted funds £'000	Restricted funds £'000	Expendable endowment funds £'000	Permanent endowment funds £'000	2016 Total funds £'000
Income and endowments from donations and legacies	3,290	54	–	240	3,584
Income from charitable activities					
Grants for charitable activities	992	57,089	–	–	58,081
Trading in furtherance of charitable activities	8,730	257	–	–	8,987
	9,722	57,346	–	–	67,068
Other trading activities	1,710	–	–	–	1,710
Income from investments	1,494	3,800	–	–	5,294
Other income	17	37	–	–	54
Total income	16,233	61,237	–	240	77,710
Raising funds	3,463	317	77	264	4,121
Expenditure on charitable activities					
Promoting science and its benefits	433	473	–	–	906
Recognising excellence in science	120	6	–	–	126
Supporting outstanding science	7,203	45,030	–	–	52,233
Providing scientific advice for policy	1,304	1,070	–	–	2,374
Fostering international and global cooperation	978	11,685	–	–	12,663
Education and public engagement	3,086	2,013	–	–	5,099
	13,124	60,277	–	–	73,401
Total expenditure	16,587	60,594	77	264	77,522
Net (expenditure)/ income before net (losses)/ gains on investments	(354)	643	(77)	(24)	188
Net (losses)/ gains on investments	(2,489)	(1,035)	(1,574)	(5,650)	(10,748)
Net (expenditure)/ income for the year	(2,843)	(392)	(1,651)	(5,674)	(10,560)
Gross transfers between funds	742	(742)	–	–	–
Actuarial gains/ (losses) on defined benefit pension scheme	1,700	–	–	–	1,700
Net movement in funds	(401)	(1,134)	(1,651)	(5,674)	(8,860)
Total funds brought forward	84,180	42,792	30,487	107,813	265,272
Total funds carried forward	83,779	41,658	28,836	102,139	256,412

29. Prior year comparison – Analysis of net assets between funds – Group

	Unrestricted funds £'000	Restricted funds £'000	Expendable endowment funds £'000	Permanent endowment funds £'000	2016 Total funds £'000
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Funds balances at 31 March 2016 are represented by:

Tangible fixed assets	15,904	–	–	–	15,904
Heritage assets	49,277	–	–	–	49,277
Investments	27,466	41,658	28,836	102,139	200,099
Net current liabilities	(204)	–	–	–	(204)
Creditors: Due after one year	(51)	–	–	–	(51)
Defined benefit pension scheme liability	(8,613)	–	–	–	(8,613)
Net assets	83,779	41,658	28,836	102,139	256,412

30. Prior year comparison – Movements on Trust and specific funds in year – Group

	Brought forward at 1 April 2015 £'000	Income £'000	Expenditure £'000	Transfers £'000	Investment and actuarial gain/(loss) £'000	Carried forward at 31 March 2016 £'000
Permanent endowment funds						
Life Sciences Trust	12,633	–	(33)	–	(653)	11,947
Maths and Physical Sciences Trust	11,588	–	(30)	–	(599)	10,959
RW Paul Instrument Fund	12,426	–	(32)	–	(642)	11,752
Theo Murphy – UK	59,558	–	(155)	–	(3,078)	56,325
Other Permanent Endowments	9,034	240	(14)	–	(406)	8,854
Theo Murphy – Australia	2,574	–	–	–	(272)	2,302
Total permanent endowment funds	107,813	240	(264)	–	(5,650)	102,139
Expendable Endowment Funds						
General Trust Fund	11,651	–	(30)	–	(602)	11,019
Life Sciences Trust	7,404	–	(19)	–	(383)	7,002
Maths and Physical Sciences Trust	4,032	–	(10)	–	(208)	3,814
Other Expendable funds	7,400	–	(18)	–	(381)	7,001
Total expendable endowment funds	30,487	–	(77)	–	(1,574)	28,836
Restricted funds						
Life Sciences Trust	9,020	718	(1,187)	(105)	(479)	7,967
Maths and Physical Sciences Trust	7,857	583	(614)	(79)	(408)	7,339
Enterprise Fund	7,346	8	(202)	(17)	639	7,774
Other restricted funds	18,569	59,928	(58,591)	(541)	(787)	18,578
Total restricted funds	42,792	61,237	(60,594)	(742)	(1,035)	41,658

30. Prior year comparison – Movements on Trust and specific funds in year – Group (continued)

	Brought forward at 1 April 2015 £'000	Income £'000	Expenditure £'000	Transfers £'000	Investment and actuarial gain/(loss) £'000	Carried forward at 31 March 2016 £'000
Unrestricted funds						
General Trust Fund	13,890	680	(494)	(67)	(715)	13,294
BIS Science and Research	–	992	(992)	–	–	–
Revaluation Reserve	47,856	–	–	–	–	47,856
Defined Benefit Pension Reserve	(10,665)	–	352	–	1,700	(8,613)
Other	–	–	–	–	–	–
General Purpose	33,099	14,561	(15,453)	809	(1,774)	31,242
Total unrestricted funds	84,180	16,233	(16,587)	742	(789)	83,779
Total for all trusts						
Life Sciences Trust	29,057	718	(1,239)	(105)	(1,515)	26,916
Maths and Physical Sciences Trust	23,477	583	(654)	(79)	(1,215)	22,112
RW Paul Instrument Fund	12,426	–	(32)	–	(642)	11,752
Theo Murphy – UK	59,558	–	(155)	–	(3,078)	56,325
Other Permanent Endowments	9,034	240	(14)	–	(406)	8,854
Theo Murphy – Australia	2,574	–	–	–	(272)	2,302
General Trust Fund	25,541	680	(524)	(67)	(1,317)	24,313
Other Expendable funds	7,400	–	(18)	–	(381)	7,001
Enterprise Fund	7,346	8	(202)	(17)	639	7,774
Other restricted funds	18,569	59,928	(58,591)	(541)	(787)	18,578
BIS Science and Research	–	992	(992)	–	–	–
Revaluation Reserve	47,856	–	–	–	–	47,856
Defined Benefit Pension Reserve	(10,665)	–	352	–	1,700	(8,613)
Other	–	–	–	–	–	–
General Purpose	33,099	14,561	(15,453)	809	(1,774)	31,242
Total unrestricted funds	265,272	77,710	(77,522)	–	(9,048)	256,412



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For further information

The Royal Society
6 – 9 Carlton House Terrace
London SW1Y 5AG

T +44 20 7451 2500

W royalsociety.org

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