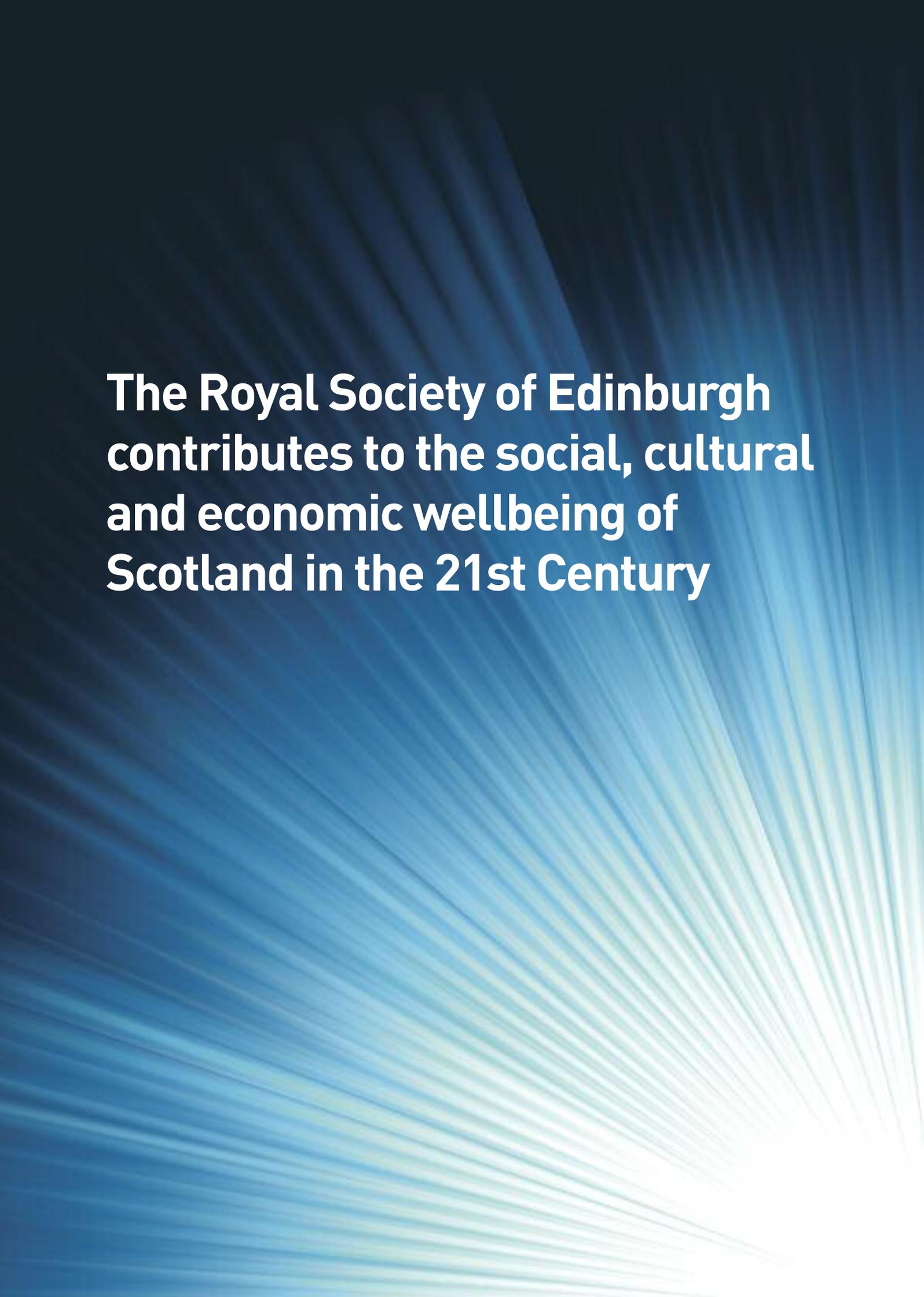


TOWARDS A
NEW
ENLIGHTENMENT



ANNUAL REVIEW

APRIL 2012 – MARCH 2013



**The Royal Society of Edinburgh
contributes to the social, cultural
and economic wellbeing of
Scotland in the 21st Century**



PROFESSOR SIR JOHN ARBUTHNOTT

“ The strategic vision is to generate a New Enlightenment by continuing to build a dynamic relevant National Academy for Scotland. ”

PRESIDENT'S FOREWORD

In 2012, with the aim of building on our successful contribution in recent years, the Royal Society of Edinburgh launched a new Strategic Framework *Towards a New Enlightenment*. The strategy provides a broad framework and a clear direction through which RSE Fellows and staff can deliver activities that contribute to the well-being of people in Scotland.

The strategic vision is to generate a *New Enlightenment* by continuing to build a dynamic and relevant National Academy for Scotland. Our Fellowship has proven its excellence, and will serve as an independent source of inspiration, engagement and expertise in Scotland and beyond.

Over the past year we have delivered a wide and varied programme of activities which have supported and contributed to that vision.

In conjunction with the British Academy, we launched an event series *“Enlightening the Constitutional Debate”* with the aim of encouraging informed and widespread discussion around key topics in the lead up to the 2014 Independence Referendum.

We celebrated the CERN discovery of a particle consistent with the Higgs boson through the creation of an RSE exhibition *From Maxwell to Higgs*. We produced a report on *The Financing of Innovation in Scotland* that addresses issues around the current financial environment for businesses seeking to grow and develop in Scotland.

A major new Inquiry *Spreading the Benefits of Digital Participation* will seek to ensure that digital technologies help to narrow rather than widen the social divide.

An inspirational Schools Christmas Lecture this year was delivered by the Olympic Gold Medal-winning rower, Katherine Grainger MBE.

As well as these highlights, we continue to support research and enterprise; promote international connections; enhance the public's interest in scientific and cultural issues; provide expert opinion, and develop cross-sector partnerships.

Within the pages that follow, you can read more about all these

activities, and others, which were delivered with the help of Fellows who give freely of their time, supported by the RSE's hard-working staff.

The Review also demonstrates not just intentions, but achievements that have added value.

Many of our activities are delivered in partnership with other bodies and individuals who wish to make their own personal contribution to Scottish society. To them all, I offer my sincere thanks for their support during this past year and in previous years. The RSE will continue to strive to make a meaningful contribution to the well being of Scotland and its people.

These are exciting times.

Professor Sir John Arbuthnott

ENHANCING THE CAPACITY OF WORLD-CLASS SCIENCE AND CULTURE RESEARCHERS WORKING IN SCOTLAND

Building Research Capacity

In this reporting period, an additional £6.2M was attracted into the Scottish research pool by our Scottish Government Research Fellows. This takes the total generated since 2003 to more than £50M. In 2012/13, 40 collaborations were formed with institutes across Europe, the USA and Canada, including Harvard Medical School, the Universities of Cornell, Stanford and Dalhousie, the National University of Singapore, Aarhus University and Basel Biozentrum; as well as with institutes in other parts of the UK, including Imperial College, UCL and the Universities of Cambridge, Warwick, Southampton, Liverpool and Newcastle.

Although the number of awards is relatively small, the impact the Research Fellows have made is great. They attract large sums of funding into the research community in Scotland and help to retain research talent here. European funding through the FP7 programme helps Scottish-based Research Fellows broaden their research networks internationally and showcase Scottish talent on a global stage. We awarded three new Scottish Government Personal Research Fellowships this year, two based at the University of Glasgow, the other at Dundee University. Research covered cardiovascular disease, transcription factors in barley, and developing a new computational protocol to provide accurate data on how catalysis work.

Since 2004, we have awarded fourteen CRF Biomedical Research Fellowships. Twelve of these have secured permanent positions in

academia or industry, or have been awarded further major research awards by the MRC or biomedical research charities. Eight of the awardees are still working in Scotland. In 2012/13, we awarded one CRF Fellowship. The holder, Dr Christine Demore, is based at the University of Dundee, where she is working on creating a new miniature ultrasound system with ultra-high resolution which will be 50 times better than conventional ultrasound.

In 1988, the RSE received money from BP to fund post-doctoral research fellowships. Since then, we have awarded 34 Research Fellowships, in various disciplines including information technology, geology and chemical engineering. In 2012/13, we awarded a BP Research Fellowship to Dr Stuart Robertson, based at University of Strathclyde. Stuart is researching and developing Alkali-Metal Mediated Alumination, to develop an exciting methodology for application in practical areas of high socio-economic importance such as hydrogen storage (renewable energy), organic transformations and materials science.

Supporting Culture

The RSE Arts & Humanities Awards allow projects to get off the ground and provide leverage to secure more substantial grants from other sources, often outwith Scotland. In this reporting period we awarded 22 Small Research Grants and seven Research Workshops.

As an example, the RSE supported the Simonides Exhibition with an Arts and Humanities grant in 2011. The exhibition, a mixture of photographs and poetic text, was launched at the Edinburgh Art Festival and it has

since been taken to the Whitney Humanities Center at Yale. It has also been broadcast on Radio 4, and was a finalist for the Poetry Society's Ted Hughes Award for New Work in Poetry.

Raising Scotland's Research Profile Abroad

The RSE International Programme increases Scotland's research and development connections worldwide. This year, we made 42 awards to support world-class science and culture researchers working in Scotland. We also continued to run a programme of joint research projects with the National Natural Science Foundation of China (NNSFC), making six new awards in 2012/13. A number of previous projects were also completed this year, resulting in 18 publications, a patent for a chaos-based communication system and an application to the EU FP7 Marie Curie Actions Fund for an international researcher.

The RSE also awarded ten CRF European Fellowships and seven J M Lessells Travel Scholarships. These covered a wide range of projects, including the exchange of knowledge and experience on infections during childbirth, advanced planetary observation systems, and creating a business model for university spin-out companies.

These various schemes help develop international links, create conditions for talented people to live, learn, visit, work and remain in Scotland, and support Scotland's reputation as a distinctive global identity.

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This prestigious award from the Royal Society of Edinburgh was a brilliant opportunity and a vital step in my career. During this time it was possible to follow and develop my own research projects, publish results in international journals and to establish local and international contact and collaborations.

JAN KLETT, 2009 BP RESEARCH FELLOW

I have just heard that my application to the Leverhulme Trust for a follow-on grant has been successful. They have awarded me £243,000 for three years for a project which emerges directly from the Turkey Red Textiles project supported by the RSE Arts & Humanities Award.

PROFESSOR STANA NENADIC, 2011 ARTS & HUMANITIES GRANT AWARDEE



This bilateral scheme is an incredibly useful resource. For relatively small sums of money, it can really help to shape the research performed in Scottish institutions and elsewhere.

DR DEREK WANN, 2012 INTERNATIONAL EXCHANGE PROGRAMME BILATERAL AWARDEE

Thanks to the generous funding from the RSE Caledonian Research Fund, the fieldwork for the overall project has yielded some immediate results in terms of the image database and the research articles which are in process. It has also led to some exciting future developments such as a new fieldwork project and an international workshop.

DR REBECCA SWEETMAN, 2011 CRF EUROPEAN RESEARCH FELLOW



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STRENGTHENING CONNECTIONS AMONGST ACADEMIA, BUSINESS, THE PUBLIC AND THE VOLUNTARY SECTOR

Supporting Enterprise

Since its inception in 1997, more than 80 high-technology businesses have been formed from the Enterprise Fellowships scheme and at least 60 are still trading. They have raised more than £70m in follow-on investment, of which 90% is from the private sector. In this reporting period alone, more than £16M of investment was raised, 14 employees were recruited (across six companies); eight new products were launched and eight new companies were incorporated. An independent review of these awards was commissioned by Scottish Enterprise and carried out in the early summer of 2013. The subsequent report is expected in September.

Through the Scottish Enterprise – funded Enterprise Fellowship programme, we ran two rounds of awards this year and five were made from a total of 25 applications. In addition, one BBSRC Enterprise Fellowship and two STFC Enterprise Fellowships were awarded.

Stimulating Business Innovation

The RSE Entrepreneurs' Club brings together the alumni of the Enterprise Fellowship programmes twice a year. Stakeholders in the programmes, mentors, RSE business Fellows and Investors all meet to network at the RSE in April and October. Speakers have come from a number of different organisations, including the Saltire

Foundation and Scottish Development International, as well as the Global Scot network and Fellows of the RSE.

The RSE Business Innovation Forum published a new report in October 2012 on *The Financing of Business Innovation in Scotland*. This clarifies the outcomes and conclusions of a consultation process undertaken by the Business Innovation Forum. It covers the topics of the financing of innovation in Scottish companies and the aspects and characteristics of the current financial environment which support or constrain businesses seeking to grow and develop in Scotland. Its principal recommendations are:

- A senior-level advisory group should be established to investigate and report on the feasibility of mobilising new sources of risk capital in Scotland.
- The infrastructure available to support Scottish companies in connecting with sources of equity investment outside Scotland should be reviewed. This would involve consultation with a range of interested parties across both private and public sectors.
- An evaluation should be undertaken of the potential for and feasibility of creating a new vehicle or vehicles to provide access to loan funding for emerging Scottish companies on terms which would be viable for the businesses and acceptable to the lenders.

Building Productive Partnerships

In May 2012, the RSE formed a *Learned Societies' Group on Scottish Science Education*. This group was formed to respond to concerns about the delivery of science education in Scottish schools and to contribute ideas and analysis to the major reforms that are already underway. The Group is facilitated by the RSE, with other members drawn from the Royal Society of Chemistry, the Institute of Physics, the Society of Biology, the British Computer Society, the Association of Science Education, the Scottish Schools Education Research Centre and the Engineering Policy Group in Scotland.

In collaboration with the David Hume Institute, we are considering the roles and contributions of universities in Scotland. This project is on-going and a number of roundtable discussion sessions were held in 2012 on topics including: *The role of universities in the economy*; *Who are universities for?* and *The school/college/university interface and collaboration*. The series will continue throughout 2013/14 and, following its completion, a set of policy papers will be published to help inform the next iteration of policy in this area, ahead of the Scottish Parliamentary elections in 2016.



CINEMOTUS

Just to let you know my trip to the States was a great success. In addition to Fox, we are now negotiating with Disney and Sony to use my plug-in! So, an excellent result.

MATTHEW BETT, RSE/SE ENTERPRISE FELLOW 2011 AND DEVELOPER OF CINEMOTUS

My Enterprise Fellowship was vital in supporting me make the transition from academia to business start-up. During my Fellowship, I acquired important business skills and knowledge and I was able to take a step back and properly validate the market and opportunity for the technology that I wished to commercialise.

DR MIKE LINCOLN, RSE/SE ENTERPRISE FELLOW 2010 AND FOUNDER AND CTO, QUORATE TECHNOLOGIES LTD



The RSE Enterprise Fellowship programme was entirely responsible for the formation of our business. Since spinning out from Edinburgh Napier University, Surface Active Solutions (SAS) has won several top accolades for both technical and commercial achievement. SAS has secured over £800k in funding and has achieved in excess of £5m in international sales of product manufactured in Scotland. Our technology has been used to treat over 50,000 tonnes of hazardous waste and continues to have a growing impact across the globe.

JOHN HARRISON, RSE/SE ENTERPRISE FELLOW 1999 AND MANAGING DIRECTOR, SURFACE ACTIVE SOLUTIONS (SAS)

I have spent a significant time in London and was asked to attend the Olympic Business Summits organised by the UK Government. It was a great experience and I met with Michael Moore MP, who has asked to visit us in Glasgow. This has led to work with the DTI exploring markets worldwide such as Brazil, which has a thriving Life Sciences sector.

DR MARGARET ANNE CRAIG, RSE/BBSRC ENTERPRISE FELLOW 2011 AND FOUNDER AND CEO OF CLYDE BIOSCIENCES LTD



ENHANCING THE RSE YOUNG ACADEMY OF SCOTLAND'S CAPACITY TO CONTRIBUTE TO THE FUTURE OF SCOTLAND

Creating and Developing the RSE Young Academy of Scotland

The RSE Young Academy of Scotland (YAS) fosters interdisciplinary activities among emerging leaders from the disciplines of science and humanities, the professions, the arts, business and civil society. Established by the RSE in 2011, with an initial membership of 68, the YAS provides a platform for able and innovative young entrepreneurs, professionals and academics within the age range of mid 20s to early 40s to develop a coherent and influential voice, and to address the most challenging issues facing society in Scotland and beyond. 50 new members were appointed in March 2013 and the membership now stands at 118, with 51 females and 67 males.

The YAS provides a means of reaching beyond the professional environments in which members work, thus contributing to policy and practice in all areas. It provides an opportunity for its members to interact, across disciplines and professions, with decision makers, opinion formers and experts, business leaders, funding bodies, national institutions, the public and the media within Scotland, the UK and internationally. The YAS is part of a growing international movement in which national academies are establishing young academies across Europe and beyond.

The Work of the Young Academy of Scotland

A number of Working Groups have been and are being formed to pursue beneficial projects of interest to the membership:

- **Scottish Constitutional Reform.** In partnership with the David Hume Institute (DHI) a group is working on a potential series of events, where the main political parties will present their positions on Constitutional Change.
- **Tapping all our Talents.** As a follow-up to the RSE's own major independent report into the low proportion of women qualified in STEM subjects in the workplace, a group organised a panel debate entitled *Strategies to address inequalities in the workplace*. Six panellists, under the chairmanship of Young Academy member Peter Reekie, gave their perspective on how to tackle gender inequality, based on their own experience. The themes raised in the debate and the lively discussion that followed have been developed into a working paper. The group plans to use the paper to plan further activities.
- **Open Data.** A group made a response to the HEFCE call for advice on developing the four UK funding bodies' joint policy on Open Access in the post-2014 Research Excellence Framework (REF). This is anticipated to inform development of consultation proposals on implementing an Open Access requirement in the next REF exercise, and adds to the on-going debate around Open Access to research articles and related datasets.
- **Curriculum for Excellence.** The members of this group have been involved in a number of discussions on CfE, including connecting with the Learned Societies' and RSE Education Working Groups to look at an interdisciplinary learning (IDL) event) and with the RSE Education

Working Group and History in Schools Working Group to facilitate the *Teaching History: A Model for Collaboration* event which took place at the RSE. Dialogue has also taken place with both SYP and Young Scot regarding possible areas of joint interest for next session.

- **Media Relations.** This group was formed recently and has the following remit: To proactively engage with the media about the portrayal of research within the media across the disciplines represented within the YAS, to respond to research issues debated within the media as appropriate and to deal with media issues that arise from work by the Young Academy, acting as a liaison between the media and members of the YAS.

Developing Partnerships

A number of other relationships are also being developed:

- A joint meeting was held between the YAS and representatives of the Scottish Youth Parliament and Young Scot, with a view to working collaboratively on issues affecting young people;
- The YAS was represented at the *Voices of the Future* event for young scientists at the House of Commons, organised by the Society of Biology;
- The YAS is collaborating with Young Academies in Germany, the Netherlands, Russia and Sweden on a photographic competition called *Images of Fascination* which is inviting scholars from across Europe to submit images which capture the essence of what makes research fascinating.

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My membership of the RSE Young Academy of Scotland creates opportunities for wonderfully engaging conversations with academics and non-academics from a much wider variety of backgrounds. YAS members bring a fantastic dynamic to discussions. I co-convene the Health and Wellbeing working group and hope that the interdisciplinary nature of the group's membership will lead to innovative collaborative work.

DR KAREN LORIMER, RESEARCH FELLOW IN PUBLIC HEALTH AT GLASGOW CALEDONIAN UNIVERSITY, AND MEMBER OF THE RSE YOUNG ACADEMY OF SCOTLAND

Involvement in the YAS group has helped to sharpen my own thoughts on the best way forward for public, private and academic institutions to work together in achieving better outcomes for Scotland. The YAS has demonstrated that there is an enthusiasm out there to “do something” and has provided a forum for people to come together to start working through these issues.

NEIL MCLENNAN, QUALITY IMPROVEMENT OFFICER, ABERDEEN CITY COUNCIL AND MEMBER OF THE RSE YOUNG ACADEMY OF SCOTLAND



Within my first few weeks at YAS, I was able to contribute to a consultation from the Royal Society of London on ‘open science’. The working groups represent forums within which my research has relevance, whilst at the same time providing opportunities for me to learn more about perspectives and developments in other sectors, and how my YAS colleagues there respond to similar issues.

DR MARTYN PICKERSGILL, WELLCOME TRUST SENIOR RESEARCH FELLOW IN BIOMEDICAL ETHICS, UNIVERSITY OF EDINBURGH AND MEMBER OF THE RSE YOUNG ACADEMY OF SCOTLAND

The YAS offers the chance to explore perspectives and topics in a challenging environment very different from my daily experiences in industry. Leading a working group on Scottish constitutional reform makes me feel good about making a tangible contribution, especially on an issue which affects every aspect of life in Scotland.

DES BALMFORTH, HEAD OF PROCUREMENT FOR SELEX ES AND MEMBER OF THE RSE YOUNG ACADEMY OF SCOTLAND



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ENHANCING THE PUBLIC'S CONTRIBUTION TO AND UNDERSTANDING OF SCIENCE, ECONOMIC AND CULTURAL ISSUES

A More Informed and Knowledgeable Public

Almost 4,000 people attended our events programme of 22 Lectures, five Discussion Forums, three Workshops, five Conferences, four Dissemination Events and one Reception. Of those providing feedback, 90% said that their knowledge had improved as a result of attending our Lectures. This figure rises to 91% for Conferences, 93% for Dissemination events and 94% for Discussion Forums.

The series covered a wide range of subjects from the diversity of exoplanets to cancer research and from CTR Wilson to David Livingstone. Amongst the highlights were:

Alan Turing: Legacy of a Code Breaker *10 May 2012*

From cryptanalysis and the cracking of the German Enigma Code during the Second World War to his work on artificial intelligence, Alan Turing was without doubt one of the greatest minds of the 20th Century. An extraordinarily gifted mathematician, he is rightly regarded as the father of computer science, having set in place the formal rules that govern the way every computer code ever written actually works. This lecture, delivered by Professor Jim Al Khalili, Professor of Physics, University of Surrey, was a celebration of one man's enigmatic yet ultimately tragic life – a whirlwind tour of his genius, from whether computers can have consciousness to how a leopard gets its spots.

Europe and the Arab World

27 November 2012

The countries which now make up the European Union were in a state of instability and chaos in the aftermath of war only 60 years ago. Similar instability in government, civil society and economic development is now apparent in many parts of the Arab World, which stretches from the Arabian Gulf in the east to the Atlantic in the west. This conference examined ways in which Europe may be able to help to restore stability to the Arab World, and in so doing further the related objectives of democracy and prosperity.

Joint event with the European Movement in Scotland and supported by the European Commission Office in Scotland and the Centre for Advanced Study of the Arab World.

Integrated Reporting: Benefit or Cost?

20 February 2013

In the aftermath of the financial crisis, questions have been asked of current financial reporting. Advocates of Integrated Reporting (IR) believe it offers a better way forward by providing organisations with a concise means of explaining how their strategy, governance, performance and prospects combine to create value for investors. Critics fear it may simply become another administrative burden. This discussion forum provided an opportunity for Scottish business to hear the arguments for IR and discuss its potential.

Presented in conjunction with Standard Life and Standard Life Investments.

The Evidential Basis for Food and Environmental Policy – SCRR Peter Wilson Lecture

21 February 2013

Food and environmental policy makers – and those advising them – have their work cut out in a world beset by challenges. In a lecture that covered serious issues, including food security, bovine TB and the “alleged” decline of the bumble bee, Professor Ian Boyd FRSE, the Chief Scientific Adviser to Defra, made the case for a shift to putting science at the heart of policy.

Women's Reproductive Health across the Lifecourse – Implications for Public Policy

27 and 28 February 2013

This two-day conference provided an opportunity for people from a wide range of academic and professional backgrounds to engage in discussion and debate about key ideas relating to women's reproductive health. A number of prominent themes emerged, amongst which was the need for a lifecourse approach to women's reproductive health, acknowledging the integration of concerns about education, employment and ageing with decisions about fertility, childbearing and health.

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I found the lecture very interesting and feel that it was well pitched. You didn't need to understand Maths to appreciate how much Turing achieved in his lifetime.

ATTENDEE AT THE LECTURE *ALAN TURING: LEGACY OF A CODE BREAKER*

Very useful for my studies, and also provides a way of thinking in how to exchange knowledge across the globe.

ATTENDEE AT THE CONFERENCE *EUROPE AND THE ARAB WORLD*



The lecture has rekindled my interest in farming and I would certainly like to follow up this interest with further reading. I will try to keep abreast of wider policy issues through reading and attending future events dealing with such topics.

ATTENDEE AT THE *SCRR PETER WILSON LECTURE*

It will strengthen my own ideas when I write my PhD. I will also be able to share the learning with my other colleagues at University and at my work in sexual health education.

ATTENDEE AT THE CONFERENCE *WOMEN'S REPRODUCTIVE HEALTH ACROSS THE LIFECOURSE – IMPLICATIONS FOR PUBLIC POLICY*



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ENHANCING THE PUBLIC'S CONTRIBUTION TO AND UNDERSTANDING OF SCIENCE, ECONOMIC AND CULTURAL ISSUES

More Confident and Informed School Pupils

The RSE runs a programme of activities that aims to enthuse school pupils on issues of science and culture, with a particular emphasis on inspiring those already “engaged” and reaching pupils who are not in close proximity to Scottish Universities and Science Centres, and who therefore have more limited opportunities to participate.

The programme is made possible by the expertise of our Fellows, who provide their time on a voluntary basis, and we often work in partnership with other organisations and experts to maximise the impact of our various activities. During the year, we held over 50 events, attended by more than 1,000 pupils, many of which were interdisciplinary and linked to the Curriculum for Excellence. Three highlights of the programme were:

The RSE Schools Christmas Lecture

The Annual Christmas Lecture is an exciting and educational event that features exceptional speakers in locations throughout Scotland. In 2012, Glasgow-born Katherine Grainger CBE, Olympian, delivered her lecture *The Journey to Gold* at Lochaber High School. Katherine first took up rowing at the University of Edinburgh and, since then, she has gone on to win six rowing World Championships, three Silver Olympic medals and, most recently, a Gold Medal at the 2012 London Olympic Games. These remarkable achievements make her an inspiration to all, and in her talk she spoke about the challenges she has faced, along with the successes, over the past 12 years. The RSE teamed up with BBC Scotland to web cast the lecture live to schools across the UK.

RSE @ Lochaber

In 2012, the Royal Society of Edinburgh launched a high-quality programme of activities for young people and the public across the region of Lochaber. This programme of inspirational educational talks, discussion forums and workshops began in September 2012 and will run until October 2013. While the programme is designed to appeal to all age groups, one key aim of the RSE @ initiative is to enhance the understanding and appreciation that school children have of their local community by encouraging a sense of belonging to an area rich in natural and human resources. The activities have drawn on the knowledge of Fellows and other experts from a variety of disciplines, and the themes explored are as diverse as local history, film locations, astronomy and the Large Hadron Collider.

RSE Discussion Forum

Every year, the RSE runs a day of topical debate and discussion with students across the country. In 2012, the discussion, supported by the Darwin Trust for Edinburgh, focused on issues around *Enhancements in Disability Sport*. The discussion was led by the World Champion Para-triathlete, Jane Egan, who gave students a fascinating and inspiring introduction to the various enhancements in disability sport – such as drugs and physical enhancements. She also discussed other issues facing athletes, such as the current classification system within her sport, the costs involved in taking part and the impact that coaching can have. Following their own research into these matters, the students took part in a series of debates on the key questions raised. Arbroath Academy hosted the Discussion Forum in June 2012 as part of their 50th Anniversary, and the event was held again in November at Lochaber Academy.

Supporting 21st-Century Education

The RSE and the British Computing Society came together on a project to exemplify computing science-related aspects of Curriculum for Excellence. Three extensive resources comprising tutor and learner materials were launched at the RSE in December 2012. The materials have been trialled in schools across Scotland and have received a very positive response from teachers. They have received national and international praise and the project leader, Jeremy Scott, gave a presentation about the project at the App Inventor Summit in the summer of 2012, which was organised and hosted by the Massachusetts Institute of Technology. The project has now been extended until August 2014 to enable the development of a further suite of materials to support the new national qualifications in Computing Science.

Developing International Collaborations

We also work with partners to create events that heighten public understanding of key international issues. This year these included two events with the French Embassy, London, as part of a Franco-Scottish Science Seminar Series, an event entitled *Humanising the Workplace* as part of the Festival of Politics (in association with British Council Scotland; the Institute for Advanced Studies in the Humanities; RSA UK; Museums Galleries Scotland; and UNESCO UKNC Scotland Committee), and a Scotland-Taiwan Workshop on Electronic Materials and Nanomaterials that brought researchers from Taiwan to Edinburgh to meet and work with their counterparts.

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Katherine Grainger is pictured at the 2012 RSE Christmas Lecture with a pupil of Lochaber High School

Katherine Grainger's Christmas Lecture, delivered in association with the Royal Society of Edinburgh, was a memorable event. The presence of the BBC added to the sense of occasion and our pupils found Katherine engaging, humorous and inspiring. After the lecture, the young people had the opportunity to meet Katherine, get her autograph, take photographs and handle the gold medal!

JIM SUTHERLAND, HEAD TEACHER,
LOCHABER HIGH SCHOOL

I welcome the production of the RSE exemplification materials on computing science. They are a valuable resource which will help teachers develop pupils' understanding of core computing concepts and the associated skills as part of Curriculum for Excellence, from early secondary into the new qualifications.

DR ALASDAIR ALLAN, MSP, SCOTTISH GOVERNMENT MINISTER FOR LEARNING, SCIENCE AND SCOTLAND'S LANGUAGES



Dr Alasdair Allan is pictured (left) with Jeremy Scott, RSE/BCS Computing Science Exemplification Project Leader, at the launch event

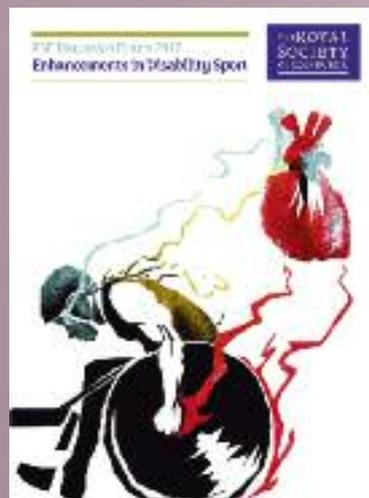


I just wanted to let you know how much Lauren Evans and George Hutchison are enjoying the science classes at Dundee. I have never seen Lauren so enthusiastic about anything, so I would like to give you and your team a huge thank you.

VICKI EVANS, PARENT OF MASTERCLASS STUDENT

Would like to do it again, please organise another one!

STUDENT, DISCUSSION FORUM



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INFORMING AND INFLUENCING PUBLIC POLICY DECISIONS

Parliamentary and Public Engagement

The RSE uses the multi-disciplinary knowledge and expertise of RSE Fellows and other experts engaged by the Society, to provide independent evidence-based advice to inform public policy decisions made by the Scottish, UK and European Parliaments and Governments.

Outputs have included 11 Consultation Responses, one Briefing Paper, seven Projects/Reports and 19 dissemination events following on from our *Tapping All our Talents Report*, including presentations in the Scottish Parliament and Westminster.

Education Committee

- An RSE event, on *The Teaching of History: a model for collaboration*, was held at the RSE on 2nd February 2013.
- Members of the Education Committee met with the Cabinet Secretary and education officials at the RSE on 30th January. The meeting provided the opportunity to learn about the Government's plans for evaluation of CfE and discuss the involvement of the RSE.
- The Education Committee has been paying close attention to the debate surrounding the future of Higher and Further Education in Scotland.

Enlightening the Constitutional Debate

On 18 September 2014, the Scottish people will be asked if Scotland should be an independent country. The issue of Scottish independence is the biggest constitutional issue facing the UK at the moment, with far-reaching implications for all UK citizens. In 2012, the RSE and the British Academy convened a conference on *Scotland and the United Kingdom* to provide a platform for informed discussion on this matter. Following that, a programme of public events over 2013/14 was established to enable further, detailed discussion on topics relevant to the constitutional debate.

Spreading the Benefits of Digital Participation

In February 2013, the RSE launched an Inquiry into Digital Participation in Scotland. Digital information and communications technologies are changing the way we live, work and play, and the pace of change will continue.

The Inquiry will take stock of social, economic and cultural communities across Scotland that are not yet enjoying these benefits to the full. We will engage with these communities to understand the barriers to engagement, and develop strategies to overcome them and ensure that the increasingly central role digital technology plays in society contributes to a narrowing of social divides.

Tapping all our Talents – Women in STEM

The RSE published its Report *Tapping all our Talents – Women in Science, Technology, Engineering and Mathematics (STEM)* in April 2012. The Report recognised that the majority of women with qualifications in STEM subjects do not work in STEM areas, in contrast to men, representing a serious loss to the economy, as well as a loss of opportunity to many well-qualified women. The Report called on Scotland to address the issue, proposing the establishment of a strategy to increase the proportion of women in the workplace qualified in STEM subjects, and to increase the number who rise to senior positions in universities, research institutes, government, business and industry.

The Report was produced by an expert Working Group, chaired by the astrophysicist Professor Dame Jocelyn Bell Burnell DBE CBE FRS FRSE, with Professor Alice Brown CBE, RSE General Secretary, serving as Deputy Chair. Both Dame Jocelyn and Professor Brown attended the launch of the Report at the RSE, as did other members of the Working Group and a wide range of people with a strong interest in the topic.

Following the publication of the Report, a number of dissemination events were held around Scotland, and this included a Cross-Party Group meeting in the Scottish Parliament in late May. Meetings have also taken place with the Scottish Funding Council, the Equality Challenge Unit and the Department of Business Innovation and Skills.

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The amendment refers to the loss of women who are trained in science, technology, engineering and maths. It is not only about getting women into those subjects but about the fact that many women who start off in them drop out later on – I am part of that 73 per cent. That loss was the subject of an excellent report that was published by the Royal Society of Edinburgh and produced by a Working Group chaired by the distinguished astrophysicist Professor Jocelyn Bell Burnell. I was honoured to chair a meeting of the Cross-Party Group on Science and Technology at which she gave an extremely inspiring and thought-provoking presentation on the Working Group’s findings. She is a great inspiration to aspiring women scientists.”

DR ELAINE MURRAY MSP

The RSE made it clear in its briefing that “The role of the wider science community is not to determine policy; that is for Government; their role is to develop and present the evidence for different policy options.” It went on to say: “Science is concerned to understand the working of nature, it is for society to determine how that understanding should be used.”

LIAM MCARTHUR MSP



I am grateful to the Royal Society of Edinburgh for its briefing paper to members, which tells us: “much more scientific knowledge exists outside than within government”. We probably all knew that, but good progress is being made in Scotland and in the European Union in that regard.

WILLIE COFFEY MSP

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RECOGNISING EXCELLENCE

New Fellows

Recognised by their peer groups as having achieved excellence within their discipline or profession, five Honorary Fellows, three Corresponding Fellows and 39 Fellows were newly elected to the RSE Fellowship. These new Fellows increased our Fellowship to a total of 1,565 Fellows, comprising 64 Honorary Fellows, 64 Corresponding Fellows and 1,437 Fellows.

We encourage all our Fellows to participate as much as possible in our activities, as their contribution is pivotal to us being able to do and achieve what we do. The time they spend in supporting and enabling the delivery of our activities is an exceptional free public resource, the annual value of which is in excess of £0.7m.

Royal Medals

The RSE Royal Medals capture the spirit of the Society's Royal Charter of 1783 and its remit to advance learning and useful knowledge. They were created in 2000 to mark the Millennium and have been awarded annually since then, with the express approval of Her Majesty The Queen.

Two Royal Medals were awarded this year, to Professor Sir Edwin Southern and Dr David Milne. The Medals were presented by HRH The Duke of Edinburgh at a ceremony held at the RSE in September 2012. The Duke has been an Honorary Fellow of the RSE since 1951.

Professor Southern received his Medal in recognition of his outstanding contribution to molecular biology, whilst Dr Milne was awarded his Medal for his outstanding contribution to business and commerce in Scotland.

IEEE/RSE/Wolfson, James Clerk Maxwell Award

The Clerk Maxwell Award is a joint award made by the RSE and the IEEE, funded by Wolfson Microelectronics plc. It recognises groundbreaking work by those who follow in Maxwell's footsteps and was first presented in 2006. In 2012, the US \$20,000 honorarium, gold medal and certificate went to Professor Gerhard Sessler, who has helped revolutionise the modern microphone market, not once but twice during his career. The award was presented to Professor Sessler by HRH The Duke of Edinburgh at the ceremony held at the RSE in September 2012.

RSE Prize Winners

In 2012/13 we also awarded the following senior prizes:

- > RSE / Sir Walter Scott Medal – Professor David Hewitt FRSE for his outstanding contribution to Scottish Literature.
- > RSE / Lord Kelvin Medal – Professor Peter Davies FRSE, for his outstanding contribution to the discipline of Fluid Mechanics.
- > RSE / Sir James Black Medal – two separate medals were awarded; to Professor Christopher Haslett OBE, FRSE, FMedSci, for his outstanding contribution to inflammation research, and to Professor Andrew Whiten FBA, FRSE, for his outstanding contribution to making Scotland foremost in the UK in the study of primates and animal behaviour.

And early-career prizes:

- > RSE / Patrick Neill Medal – Dr Marc Dweck, for his outstanding research work in the field of clinical cardiology.
- > RSE / Makdougall Brisbane Medal – Dr Aidan Robson, for his breadth and depth of knowledge in his research field – particle physics.
- > RSE / Thomas Reid Medal – Dr Gordon Pentland, for his high-quality research which contributes significantly to British and Scottish political and cultural history.
- > RSE / Henry Duncan Medal – Mr Neil McLennan, for his outstanding contribution to civic society, creativity and social enterprise, education and the social sciences.

Other Prizes

The RSE Prizes for Public Engagement, supported by The James Weir Foundation, recognise and reward excellence in the emerging field of public engagement with research. Two prizes were awarded this year: the Senior Prize to Professor Caroline Wilkinson, Professor of Cranial Identification at the University of Dundee; and the Innovator's Prize to Dr Chris Speed, Reader in Architecture at Edinburgh College of Art.

Following an announcement by scientists at CERN of the discovery of a particle consistent with the Higgs boson, the RSE awarded a specially-commissioned medal to Professor Peter Higgs CH FRS FRSE at its Annual Statutory Meeting in October 2012. The award was made to recognise his outstanding research that was central to proposing the particle's existence.



RSE PRESIDENT, SIR JOHN ARBUTHNOTT, PICTURED WITH PROFESSOR LESLEY YELLOWLEES, AT THE NEW FELLOWS' INDUCTION DAY, MAY 2012



HRH THE DUKE OF EDINBURGH, PICTURED AT THE PRESENTATION OF THE 2012 ROYAL MEDALS WITH AWARDEE, DR DAVID MILNE OBE



PROFESSOR GERHARD SESSLER, PICTURED RECEIVING THE IEEE/RSE/WOLFSON, JAMES CLERK MAXWELL MEDAL FROM HRH THE DUKE OF EDINBURGH AT A CEREMONY AT THE RSE



PROFESSOR PETER HIGGS CH, PICTURED WITH RSE PRESIDENT, SIR JOHN ARBUTHNOTT, AFTER RECEIVING A SPECIALLY-COMMISSIONED MEDAL AT THE RSE ANNUAL STATUTORY MEETING, OCTOBER 2012



HRH THE DUKE OF EDINBURGH, PICTURED AT THE PRESENTATION OF THE 2012 ROYAL MEDALS WITH AWARDEE, PROFESSOR SIR EDWIN SOUTHERN KB



IMAGE OF THE MEDAL AWARDED TO RSE SENIOR PRIZE-WINNERS

REACHING OUT

“From Maxwell to Higgs”

The RSE, in collaboration with the University of Edinburgh’s School of Physics and Astronomy, created an exhibition that celebrates the discovery at CERN of a new particle consistent with the Higgs boson. *From Maxwell to Higgs* shows the important role Peter Higgs has played, whilst also highlighting the historic discoveries and theories that have influenced current thinking about the existence of such a particle.

From James Clerk Maxwell’s Electromagnetic Equations, through to Albert Einstein’s Special Theory of Relativity and on to the more recent Standard Model of Particle Physics, the exhibition charts a history that brings us up to date with the latest findings at the Large Hadron Collider. The display, housed in the Upper Gallery in our own historic premises, opened with a private viewing by His Royal Highness The Duke of Edinburgh, on the occasion of the Royal Medals Presentation in September 2012.

Building and Maintaining International Relations

The RSE has Memoranda of Understanding with a number of overseas sister Academies and our international exchange programmes and joint research projects are products of the relationships which flow from these Memoranda. The relationships also act as a catalyst for other international engagement activities such as conferences and seminars. Events take place both in Scotland and overseas, and are

attended by international as well as Scottish participants.

We also serve as Scotland’s representative on ALLEA (All European Academies), a body which comprises 53 academies from across Europe. This relationship provides excellent opportunities for developing links with other Academies on behalf of Scotland.

Spreading Knowledge

We continue to publish two highly-regarded scientific journals, this year producing two issues of *Earth and Environmental Science Transactions of the Royal Society of Edinburgh*, and six issues of *Proceedings of the Royal Society of Edinburgh, Section A: Mathematics*. Our journals have a broad reach in terms of both their author and subscriber base. They are distributed worldwide, to the Americas, Europe, Australasia, the Middle East, Africa and Asia, and the peer review process draws on a truly international bank of referees and editors.

In December, we published Issue 13 of our *Science Scotland* magazine, entitled *The Business of Biomedicine*, the second part of two editions dedicated to highlighting Scottish companies that have grown from the commercialisation of research. The issue illustrates how the long tradition of excellence in biomedical and life sciences research has underpinned the development of many innovative Scottish biomedical companies.

We also use the internet and social media to communicate our work more widely. In this reporting period, the RSE web site had more than

100,000 unique visitors, and that number is continuing to grow. In the first four months of 2013, the website attracted 41,816 unique visitors, compared with 24,579 over the same period in 2012. We also have 2,244 followers on Twitter, and 465 individuals and organisations “like” our Facebook page.

Friends of the Society

In 2009, the RSE launched a corporate engagement initiative entitled *Friends of the Society* with the aim of strengthening relations with the Scottish business sector. Over the last four years, a number of prominent organisations have taken part in the project which provides the “Friends” with an opportunity to find out more about the RSE and the important work we carry out.

As well as offering a platform to explore areas of mutual interest, the scheme also provides our corporate partners with a number of tangible benefits in return for a modest annual fee. Those benefits include free room hire and access to regular, exclusive networking events.

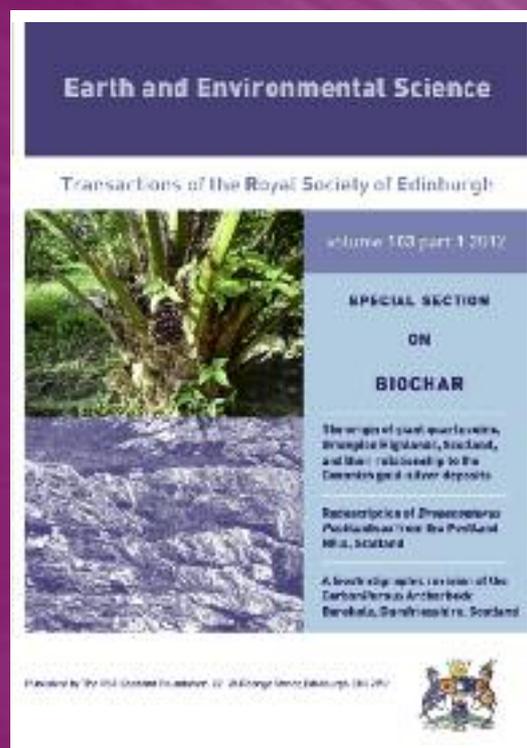
During the period covered by this review, the number of “Friends” grew once again from thirteen to sixteen, those members being – Arup, BP, FES, *The Herald*, ICE, Lloyds Banking Group, MacRoberts, Optos, Oracle, RBS, SCDI, Scottish Power, Shell UK, Standard Life, Toshiba and the Wood Group.



PROFESSOR PETER HIGGS CH, PICTURED IN FRONT OF THE RSE EXHIBITION FROM MAXWELL TO HIGGS, OPENED BY HRH THE DUKE OF EDINBURGH IN SEPTEMBER 2012



RSE MAGAZINE, SCIENCE SCOTLAND



RSE JOURNAL, EARTH AND ENVIRONMENTAL SCIENCE TRANSACTIONS OF THE ROYAL SOCIETY OF EDINBURGH



RSE FRIENDS OF THE SOCIETY 2012/13

FINANCIAL REVIEW AND FUTURE PLANS

Financial review

2012-13 was a challenging year in which to progress the RSE's vision to create "A New Enlightenment" – not least because of the need to live within reduced means. The reduction in the Scottish Government's grant in particular was not easy to accommodate. The financial result for the year was satisfactory but, given that non-recurring income helped significantly, there are no grounds for complacency.

The consolidated financial result for the year of £325,000 includes several non-recurring items – a further payment of a legacy from Dr Gethin Lewis of £75,000; a second windfall payment re sales from the digitised historical journals of £55,000, a dilapidations payment from the outgoing tenant of the 3rd floor of the building and an unplanned surplus in restricted funds arising from the early resignation of CRF research fellows amounting to £135,000.

The underlying financial outcome for the year was a surplus of £31,000, an improvement on the budget, mainly as a result of increased investment income. The support for new initiatives, such as the Young Academy, was achieved within this result without drawdown of legacies received in earlier years.

	£'000
Total net incoming resources	325
<hr/>	
Less:	
Legacy – Dr Lewis	(75)
Sales of digital archive	(55)
Surplus of CRF income	(135)
Dilapidations payment	(23)
Appeal income	(6)
<hr/>	
Surplus on recurring activities	31

Total incoming resources were £5.03 m (2012 – £6.75m), a decrease of 25% due to the exceptional income from major legacies received in 2012. Investment income was stable at £0.85m, reflecting the addition of income from legacy proceeds, but incoming resources from charitable activities decreased by 6% to £3.56m.

The major reason for the fall in incoming resources for charitable activities was the further 4% cut in Scottish Government grant-in-aid, following the 16% cut in 2012 (from £2.927m in 2011 to £2.455m in 2012, to £2.350m in 2013). Fluctuations in the pattern and numbers of Enterprise Fellow appointments also contributed to the decrease in income.

On a like-for-like basis, total expenditure decreased by 5% (£0.28m). Reductions in grants payable in support of research and innovation gave rise to the major part of this decrease, falling from £4.01m to £3.18m. This mirrors the drop in income and reflects

fewer Research and Enterprise Fellows in post. Total expenditure on influencing public policy decreased by 9%, as the launch of the new major inquiry took place towards the end of the financial year. Governance costs, which have remained at a similar level to previous years, represent less than 3% of total recurring income.

Total funds increased by £3.08m. In addition to the revenue surplus of £325,000, there were realised and unrealised investment gains of £2.783m, and a negative movement of £.03m on the actuarial pension fund liability.

Future Plans

Despite the financial pressures, much has been achieved of real public benefit, as this Annual Review shows. For the future, the RSE needs to focus on two things. First, it is important to continue to demonstrate to Government the valuable contribution which the Society, and in particular the knowledge and skills of the Fellowship, can make and is making towards addressing the economic and social challenges of the day. Secondly, the RSE needs to further diversify its sources of funding. In this context, the New Enlightenment Fund will have a crucial role in enabling the vision of "A New Enlightenment" to be more fully realised for the benefit of Scotland.

FINANCIAL REVIEW

Group income and expenditure

	General Fund £'000	Designated funds £'000	Restricted income £'000	Restricted funds £'000	2013 total £'000	2012 total £'000
Incoming resources from charitable activities	152	-	3,066	349	3,567	3,806
Legacies	-	75	-	-	75	1,630
Grants, donations, rental and investment income	295	247	-	844	1,386	1,315
Total incoming resources	447	322	3,066	1,193	5,028	6,751
Cost of generating funds	(152)	(4)	-	(122)	(278)	(255)
Charitable activities	(415)	(106)	(3,066)	(688)	(4,275)	(4,570)
Governance	(104)	-	-	(46)	(150)	(155)
Total resources expended	(671)	(110)	(3,066)	(856)	(4,703)	(4,980)
Net incoming resources	(224)	212	-	337	325	1,771

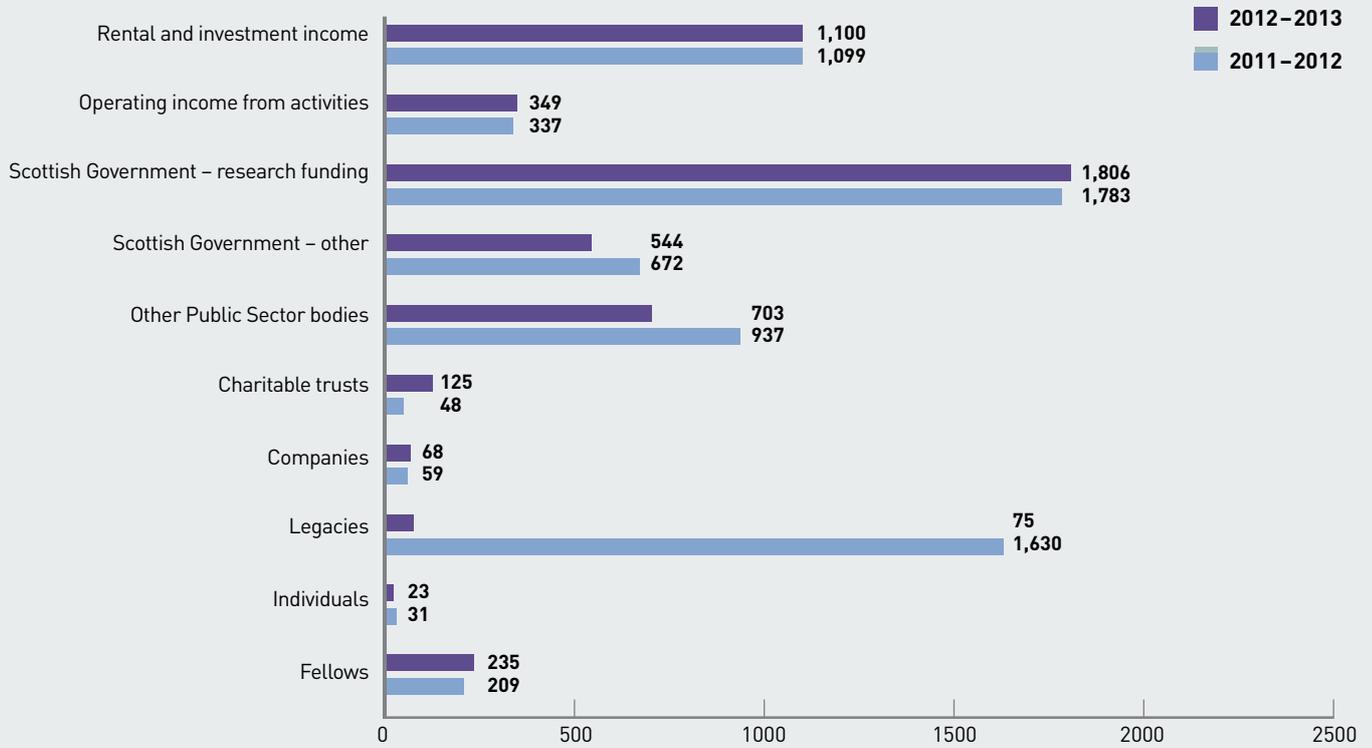
Group balance sheet

	2013 £'000	2012 £'000
Tangible fixed assets	3,558	3,653
Investments	21,883	19,100
Current assets	324	911
Deposits	2,228	1,654
Cash	585	295
Current liabilities	(1,316)	(1,372)
Provisions for liabilities and charges	(65)	(131)
Pension fund asset/(liability)	-	-
Total net assets	27,197	24,110
<i>Represented by</i>		
General fund	700	624
Designated funds	10,347	9,406
Restricted funds	16,150	14,080
Total funds	27,197	24,110

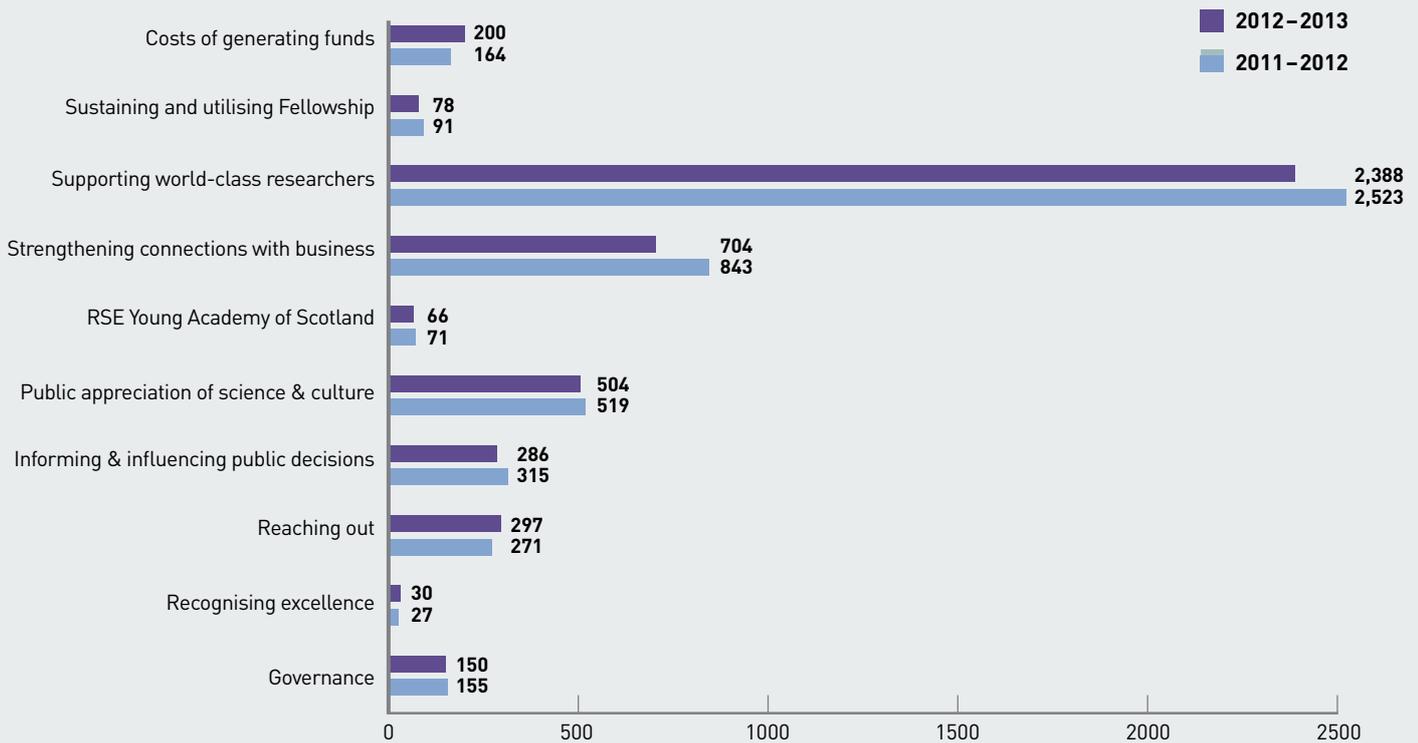
The figures above have been extracted from the audited accounts for the period ended 31 March 2013, which carried an unqualified audit report. The full Trustees' Report and audited accounts are obtainable from 22-26 George Street, Edinburgh EH2 2PQ, or on the RSE website www.royalsoced.org.uk.

FINANCIAL REVIEW

Income by source (£'000)



Resources expended (£'000)



CORPORATE GOVERNANCE AND MANAGEMENT

Council Members and Trustees of the RSE

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Vice-President:	Professor Anna Dominiczak* OBE
Vice-President:	Professor Tariq Durrani* OBE
Vice-President:	Mr Iain Ritchie CBE
Vice-President:	Professor Wilson Sibbett CBE
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Treasurer:	Mr Gerald Wilson* CB
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Observer:	Sir Brian Ivory CBE

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Young People's Programme Convener:	Dr Christian Van Der Kuyl
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Chair of RSE Scotland Foundation:	Professor Donald Ritchie*
Chair of RSE Scotland SCIO	Professor Peter Holmes• OBE

Senior Management

Chief Executive:	Dr William Duncan
Director of Finance:	Kate Ellis
Director of Corporate Services:	Graeme Herbert
Director of Business Development & Communications:	Gordon Adam

* denotes Office-Bearers elected in October 2012

• denotes Office-Bearers appointed in September 2012



The Royal Society of Edinburgh is Scotland's National Academy. Founded in 1783, its Fellowship includes some of the best intellectual talent in academia, the professions and business. It facilitates public debate, research programmes, educational projects and strategy formulation. Its strength is its diversity and impartiality. The Society's unique multi-disciplinary approach enables it to draw from and link with a broad spectrum of expertise to advance the understanding of globally-important issues. In fulfilling its Royal Charter for the 'advancement of learning and useful knowledge', the RSE is seeking to contribute to the social, cultural and economic wellbeing of Scotland.

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