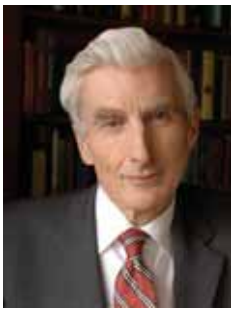
THE ROYAL SOCIETY

excellence in science

>> President's foreword



In the period covered by this review*, the Royal Society has continued and extended its activities over a wide front. There has, in particular, been an expansion in our international contacts and our engagement with global scientific issues.

The joint statements on climate change and science in Africa, published in June 2005 by the science academies of the G8 nations, made a significant impact on the discussion before and at the Gleneagles summit. Following the success of these unprecedented statements, both of which were initiated by the Society, representatives of the science academies met at our premises in September 2005 to discuss how they might provide further independent advice to the governments of the G8.

A key outcome of the meeting was an agreement to prepare joint statements on energy security and infectious diseases ahead of the St Petersburg summit in July 2006. The production of these statements, led by the Russian science academy, was a further illustration of the value of science academies working together to tackle issues of international importance.

In 2004, the Society published, jointly with the Royal Academy of Engineering, a widely acclaimed report on the potential health, environmental and social impacts of nanotechnologies. This report has had substantial influence internationally. During the past year, we have held follow-up workshops in London and Tokyo for Japanese and British scientists and policymakers. These efforts exemplify the important contribution that science academies can make in bringing together researchers and policymakers on key issues.

We have devoted increasing effort to nurturing the development of science academies overseas, particularly in sub-Saharan Africa, and are building initiatives with academies in African countries through the Network of African Science Academies (NASAC). This is indicative of the long-term commitment we have made to help African nations build their capacity in science, technology, engineering and medicine, particularly in universities and colleges.

Much of the progress we have has made in recent years on the international stage has been achieved through the tireless work of Professor Dame Julia Higgins FRS, who completes her five-year term as Foreign Secretary at the end of November. The Society owes Julia a huge vote of thanks for her extraordinary efforts. She will be succeeded by Professor Lorna Casselton FRS, who I am sure will be an effective and energetic representative for the Society around the world.

Martin Rees

* *Readers are advised that owing to a realignment of the Royal Society's internal reporting practices, this document focuses on the Society's activities for the seven-month period 1 September 2005 – 31 March 2006. Detailed information about activities and events which took place from 1 April 2005 – 31 August 2005 is available in the* 2005 Review of the Year.

>> Executive Secretary's report

Missing for three centuries, the notes and minutes of early meetings of the Society prepared by Robert Hooke reappeared in a sale of scientific manuscripts. The Society mounted a campaign to raise the money to ensure these papers were restored to their rightful place in our archives. With invaluable help from friends and the media, and through careful negotiations we secured their return only minutes before they were due to go under the hammer. Our sincere thanks go to our many donors – Fellows, friends, the Wellcome Trust and others – for their generosity and support.

Securing the future health of British science continues to be our primary function and most of our expenditure, whether from public or private sources, is devoted to this. Altogether, more than three quarters of the Society's outlay in 2005/06 was spent through our various grant and fellowship schemes on support for individuals, the funding of research and international collaboration. We now support over 580 research fellows and give out more than 1,800 grants annually.

During the year we undertook a major review of our strategic priorities to ensure that we are best placed to champion the cause of science in the years leading up to our 350th anniversary in 2010 and beyond. In addition to our traditional roles of promoting excellence in science and providing policy advice, we have identified two new priorities – reinvigorating science and mathematics education, and engaging the wider public with science. We will be launching a major fundraising campaign leading up to 2010 to enable us to achieve our ambitious new plan.

Our independence is crucial to our providing authoritative and reliable advice on policy issues, and is safeguarded because a third of our income is derived from sources other than our Parliamentary Grant-in-Aid. During 2005/06 we worked on a wide range of national and international policy issues with a scientific dimension, including the disposal of radioactive waste, preparations for an influenza pandemic and the economic implications of climate change. We were also active in providing policy advice on science and mathematics education and recently appointed Professor Michael Reiss as our first Director of Education.

The Society's 2005 Anniversary day marked the end of Lord May of Oxford's highly successful period in office as President, and we owe him a debt of gratitude for his tireless efforts. The day also hailed the start of Martin Rees' five-year presidential term. Martin has an outstanding international reputation for his research and leadership in his own discipline of astronomy. He is also recognised as an excellent communicator, as was highlighted through the Michael Faraday Award which he won in 2005. The Society is lucky to have such an accomplished figure at its helm during this vital period.

Stephen Cox

>> *Contents*

>> Providing independent scientific advice

>> The Royal Society provided advice and information on science policy issues of global importance – including energy security, infectious diseases and climate change – to policymakers in the UK and abroad in 2005/06.

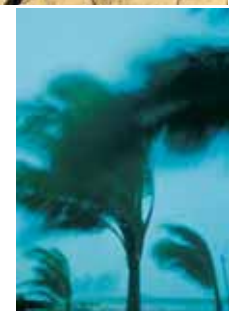
On the international stage, the Society continued its work with the science academies of the G8 nations, following on from the preparation of unprecedented joint statements on climate change and science for Africa that it initiated and led ahead of the Gleneagles summit in July 2005. In September 2005, representatives from the participating academies, including those of Brazil and India, met at the Society to discuss future work and agreed to produce joint statements on **energy security** and the threat of **infectious diseases** to feed into the St Petersburg summit in July 2006. In order to give G8 leaders the best possible overall view, the science academies of China and South Africa also contributed. The statement on energy security focused on measures that governments could take to boost a range of new and developing energy sources, while that on infectious diseases concentrated on achieving better cooperation between countries to tackle and reduce the threat of existing epidemics, such as HIV/AIDS, malaria and tuberculosis. It also considered potential future problems such as pandemic influenza.

www.royalsoc.ac.uk/G8statements

The Society also influenced international debate on science policy issues through its membership of other networks of science academies, such as the **InterAcademy Council (IAC), the InterAcademy Panel (IAP), the International Council for Science (ICSU) and the European Academies Science Advisory Council (EASAC)**. It played a key role in the preparation of the IAP's statements on biosecurity and the teaching of evolution, which were published in December 2005 and June 2006 respectively. Through EASAC, for which it provides the secretariat, the Society contributed to plans for the development of the European Research Council and the 7th EU Framework Programme for Research and Technological Development (FP7). It also fed into the independent report entitled *Vaccines: Innovation and Human Health* that EASAC initiated as a follow-on from its previous report into infectious diseases, which was published in June 2005. Furthermore, the Society contributed to EASAC's advisory report on EU electricity markets, which was presented to the European Parliament in April 2006 and highlighted the need for better electricity distribution systems and connectivity in international electricity markets.

www.easac.org

The Society's report, ***Nanoscience and nanotechnologies: opportunities and uncertainties***, published jointly with the Royal Academy of Engineering in June 2004, has continued to have an international impact, prompting scientists and policymakers worldwide to consider the development of these emerging areas of science and technology. In January 2006, the Society hosted two meetings with Japanese scientists, which focused on research into the potential health impacts of nanoparticles. Meanwhile, the Society and the Royal Academy of Engineering have maintained pressure on the UK Government to invest more in this area of research to ensure that regulators are properly informed of potential health risks associated with nanotechnologies.



The important role played by the Society and other national academies in providing independent advice is recognised worldwide, and has added momentum to the progress of new academies in developing countries. As part of its ongoing efforts to encourage the **development of scientific capacity in sub-Saharan Africa**, the Society hosted a two-day event in January 2006 to promote closer links between scientific communities of the UK and South Africa. More than 250 scientists and policymakers participated, including the South African Minister for Science, Mr Mosibudi Mangena, and the UK's Chief Scientific Advisor, Sir David King FRS.

Top left: Sir David King (left) and Mr Mosibudi Mangena

In the UK policy arena, the Society provided advice on a range of long-term issues in 2005/06. It gave further input to the work of the **Committee on Radioactive Waste Management**, highlighting the importance of scientific and technical advice in establishing a long-term storage and disposal strategy for radioactive waste. The Society also submitted evidence to the **Stern Review on the Economics of Climate Change**, being undertaken by Sir Nicholas Stern, Second Permanent Secretary to Her Majesty's Treasury, emphasising the need for high-quality scientific evidence to be taken into account when devising strategies for climate change mitigation and adaptation. It also prepared a submission to the **Government's Energy Review**, highlighting that the review was weak on its commitment to renewable energy sources, and particularly those that are further from market such as wave, tide, offshore wind and biofuels.

Issues relating to medical research featured strongly in the Society's policy work during the reporting period. Work progressed on the comprehensive **study into the use of non-human primates in research** that was launched in March 2005 and is being carried out in partnership with the Academy of Medical Sciences (AMS), the Wellcome Trust and the Medical Research Council (MRC). The results of the study, which is being conducted by a working group chaired by Sir David Weatherall FRS, are due to be published in autumn 2006. The Society has also initiated a **study into improving the research effort to reduce the threat of an influenza pandemic**. The study aims to examine the extent to which scientific evidence is being incorporated into preparedness for a pandemic, and to identify areas where policymakers should make better use of scientific evidence in policy development and contingency planning. It is due for completion by the end of 2006. Within the same timeframe, the Society expects to publish a report on its major study into the **impacts of the rapidly developing field of information and communication technology on health and healthcare**. The working group, chaired by Professor Peter Wells FRS FREng, is taking a cross-disciplinary view of the ways in which new and emerging technologies can be applied to improve health and medical research.

www.royalsoc.ac.uk/policy

>> Speaking out for science and mathematics education

>> The popularity of science subjects – particularly physics and chemistry – and mathematics among young people remains critical to the future of science and engineering. As such, the Society has been keeping this issue high on the Government's agenda by maintaining awareness of the persistent decreases in A-level physics, chemistry and mathematics entries since 1991.

Drawing on the debate surrounding changes to science GCSEs last autumn, the Society executed a **sustained media strategy** to voice support for curriculum changes, with the important caveat that these must be informed by fundamental science and increase science uptake post-16.

In January 2006, the Society expressed concern regarding the imbalances in the numbers and distribution of biology, chemistry and physics teachers, which was highlighted by new research commissioned by the Department for Education and Skills (DfES) into the recruitment and deployment of science teachers. At the same time, the Society called for a national strategy to ensure that none of the nation's secondary schools is without a specialist teacher in each of the sciences. In March 2006, the Society welcomed the Government's publication of the *Next Steps* document that outlined its aims to step up the recruitment, retraining and retention of physics, chemistry and mathematics teachers, and to achieve by 2014 substantial increases in the numbers of A-level students studying physics, chemistry and mathematics. The Society was encouraged that the Government had clearly listened to the science community regarding the need for radical changes in the face of a serious decline in science uptake, but highlighted that the Government would need to work in partnership with the science community in order to achieve its laudable ambitions.

Having taken a strong stance on science and mathematics education issues, the Society was pleased to be invited to sit on a new body set up to implement the *Next Steps* strategy, the **School Science Board**. This gives the Society a new and more powerful voice with regard to influencing the future of science education in the UK.

Also as part of the media strategy, the Society prepared a statement opposing the misrepresentation of **evolution in schools** to promote particular religious beliefs. Launched in April 2006, the statement asserted that evolution is the best explanation for the development of life on Earth, and that it is rightly taught as an essential part of biology and science courses in educational institutions across the world.

www.royalsoc.ac.uk/evolution

Bringing the science community together to consider evidence, share information and plan partnerships remained a key priority for the Society. To this end, it hosted a **conference on the theme of *Increasing science uptake post-16*** in March 2006, which brought together 80 science teachers and other education experts to examine trends in the post-16 uptake of science, the apparent or likely impact of the unprecedented stream of recent educational reforms on such uptake, and evidence from schools that have good track records in achieving progression in science from GCSE to A-level and beyond.

The conference results have impacted on the Qualifications and Curriculum Authority's current review of A-levels and have led to research aimed at encouraging more students in schools without sixth forms to take science A-levels. The results will be published in a widely read science teachers' journal. The conference also served as a platform for the Society to announce that it was taking steps to identify mechanisms whereby the science community could collaborate more effectively in providing advice on science education to Government and in supporting classroom activity. A period of consultation ensued, as a result of which a single mechanism emerged as the preferred option.

Whilst policy-orientated work is vital, the Society is also committed to providing direct support to teachers and young people, most notably through its **Partnership Grants Scheme**. In 2005/06, the scheme awarded £140,000 through 76 grants to primary and secondary schools across the UK, enabling 12,000 pupils to engage in exciting science investigations with practising scientists and engineers. The scheme, which has been in operation for six years, was extended for the first time to post-16 students. It was jointly funded by the Department for Education and Skills (DfES) and the Department of Trade and Industry (DTI).

On mathematics education, the **Advisory Committee on Mathematics Education (ACME)**, which operates under the auspices of the Society, continued to champion the importance of mathematics in the curriculum. Finding ways to implement the Post-14 Mathematics Inquiry recommendations remained a focus, with ACME hosting an October workshop that discussed the expected contents of new 14-19 mathematics courses, including those aimed at delivering 'functional' and other types of mathematics. In March, ACME hosted a major conference, *Making Mathematics Count – Two Years On*, at which the then Secretary of State for Education and Skills, the Rt Hon Ruth Kelly MP, in a keynote address, announced the introduction of an additional GCSE in mathematics from 2010 onwards. The conference featured presentations from key figures in the mathematics community and attracted 250 teachers and policymakers. It also served as a useful forum for ACME to update the participants on progress with policy development and implementation since the publication of the Smith report on post-14 mathematics in 2004 – most notably the establishment of the National Centre for Excellence in the Teaching of Mathematics which was launched in June 2006. The Centre was originally recommended by ACME in 2002.

Top right: The Rt Hon Ruth Kelly MP

www.royalsoc.ac.uk/acme

Recognising the need to play a more prominent role in influencing and supporting science education, the Society is expanding its education operation significantly. This will allow it to respond to the range of new opportunities and challenges arising in this area.

www.royalsoc.ac.uk/education

>> Supporting excellent scientists

>> Dr Julie Macpherson is typical of the 300-strong cohort of excellent young scientists in whom the Society invests each year, through its flagship University Research Fellowships, to support the future of UK science.

>> Dr Julie Macpherson

Dr Julie Macpherson is a Royal Society University Research Fellow and Reader in Chemistry at the University of Warwick. Her work focuses on the development of new tips for use in scanned probe microscopes (SPMs) – devices that use an extremely small tip connected to highly sensitive nanopositioners to 'trace' the contours of a surface.

SPM technology first emerged 30 years ago, but the first microscopes could only examine surface structure and could not take account of local chemical activity. Dr Macpherson hopes to develop new SPM tips that can detect and manipulate the chemistry of surfaces. This technology could lead to breakthroughs in a variety of diverse areas, ranging from the prevention or detection of corrosion to the treatment of sensitive teeth.

Dr Macpherson received the ***2005 Times Higher Young Researcher of the Year Award*** in recognition of her work.

University Research Fellowships provide postdoctoral researchers, considered to be potential leaders in their field, with up to ten years of funding. Now in their twenty-third year, these Royal Society fellowships enable the excellent scientists of tomorrow to pursue and develop their research without constraints. Forty-five university research fellows were appointed in 2005, bringing the total number supported during the year to 310.

Dorothy Hodgkin Fellowships provide up to four years of funding to researchers for whom career flexibility is essential, for example people with children, people in ill health and carers, in the first few years after their PhDs. 16 Dorothy Hodgkin Fellows were appointed in 2005/06, bringing the total number supported to 67.

Through its **International Fellowships programmes**, the Society fosters science and technology links between the UK and many other countries, enabling outstanding overseas postdoctoral scientists to conduct cutting-edge research in the UK. 48 incoming fellowships were awarded to scientists from North America, China, India and South East Asia, bringing the total number of scientists supported during the year to 90.

The Society's **Industry Fellowships** support knowledge transfer between scientists working in industry and academia, and are funded by the Society together with the Engineering and Physical Sciences Research Council (EPSRC), the Biotechnology and Biological Sciences Research Council (BBSRC), the Natural Environment Research Council (NERC), Rolls-Royce plc and AstraZeneca plc. Awards are made for periods of up to two years full-time or pro rata. Three Industry Fellows were appointed in 2005/06, bringing the total number supported to 22.

Wolfson Research Merit Awards, funded by the Society, the Wolfson Foundation and the Office of Science and Innovation (OSI), offer salary enhancements for up to five years with the aim of attracting or retaining in the UK key researchers with great potential or outstanding achievement. 11 awards were made during the year, bringing the total number of scientists supported to 86.

Through its **Research Professorships**, the Society provides long-term support for internationally recognised scientists of outstanding achievement and promise, allowing them to focus on research and collaboration. A total of 17 Research Professors were supported during the year.

The Society focused attention on **innovation in science and technology**, hosting its second annual event on this theme in November 2005. Dr Ben Davis received the **2005 Mullard Award**, which consists of a silver gilt medal, a prize of £2000 and a travel/conference grant of £1500. The award is given annually to an individual with an outstanding academic record, whose work is making, or has the potential to make, a contribution to the UK's prosperity. Dr Davis was recognised for his research into the structure of carbohydrates and their role in the formulation of new therapies for disease. Also at the event, Dr Adel Sharif of the University of Surrey was awarded the £250,000 **Brian Mercer Award for Innovation**. This award provides funding for individuals or groups to develop an already proven concept. Dr Sharif will use the funds to further his research into the desalination of water in regions of the world with low natural water resources.

To increase the range of professional development opportunities available to funded scientists, the Society launched its new ***Innovation and the Business of Science* course** in March 2006. Developed in collaboration with Imperial College's Tanaka Business School, the course covered science-based innovation, leadership skills and entrepreneurship, and was well received by the 21 scientists who participated. The Society continued to offer its **communication skills and media training courses** to the broader science community, with more than 100 postdoctoral scientists – including 43 of the Society's University Research Fellows – taking part in the 12 courses held during the year. Two course participants proceeded to the semi-finals of *Famelab*, a national competition to find the best new talent in science communication.

www.royalsoc.ac.uk/funding

>> Dr Maya Thanou

A Royal Society Dorothy Hodgkin Fellow working in the Genetic Therapies Centre in the Department of Chemistry at Imperial College London, Dr Maya Thanou and her team of researchers are pioneers in engineering nano-medicines for use in gene therapy. She hopes that her work will contribute to the development of future nano-medicines that will greatly improve the effectiveness of gene therapy in treating diseases, and reduce the risk of adverse reactions in patients to this form of treatment.

Of her fellowship, Dr Thanou says, 'It came at exactly the right time. I had just had my first child and was worried about how to balance motherhood with my research career. My fellowship has given me the flexibility to do this, and to pursue the research direction I wanted. It has helped me immensely.'

Top left: Royal Society University Research Fellow Dr Andrew Parker, Department of Zoology, Natural History Museum

Top right: Royal Society University Research Fellow Dr Caroline Dessent, Department of Chemistry, University of York

Top, bottom right: Royal Society Wolfson Research Merit Award Holder Dr Giles Oldroyd, Department of Disease and Stress Biology at the John Innes Centre, Norwich Research Park

>> Communicating science

>> The five-year Kohn Foundation-funded Science in Society programme came to an end in 2005/06, leaving as its legacy powerful ways for scientists to engage in dialogue with wider society.

Building on the experiences of the major nanotechnologies study in 2004, public and stakeholder engagement formed a key part of two major Royal Society policy studies during the year. The first, on personalised medicines, was published in September 2005. The second, on the impact of information and communication technology on health and healthcare, will be published later in 2006.

One of the final initiatives undertaken as part of the Kohn programme was an **in-depth study to identify the range of factors that encourage and discourage scientists from engaging with wider society**. The study found that while science communication was important, it was not a priority for the science community, with the culture of research having a negative impact on public outreach. Since its publication in June 2006, the study has stimulated widespread discussion and influenced action by funders of science.

In September 2005, jointly with the Food Standards Agency (FSA), the Society organised a groundbreaking **workshop to explore social science insights for risk assessment**. This had been initiated by Sir John Krebs FRS during his chairmanship of the FSA. Chairs and members of five Government expert committees on risk and four experts on risk sociology took part, as did Sir John, Royal Society Vice President Martin Taylor FRS and the then FSA Chief Executive Dr Jon Bell. The workshop examined two case studies on the respective topics of the transmission of bovine spongiform encephalopathy (BSE) and fish consumption. In a significant development, the workshop succeeded in gaining agreement between the expert committee scientists and social scientists on identifying key principles to be followed to enable more effective risk assessment and management. These principles focused on the themes of effective public and stakeholder communication and engagement at the outset and subsequently.

www.royalsoc.ac.uk/riskworkshop

The Society's **MP-Scientist Pairing scheme**, which has been highly praised by participants for its useful contribution to creating dialogue between scientists and parliamentarians, enjoyed a successful fifth year with 25 MP-scientist pairs taking part. This scheme became the model for the new **MEP-Scientist Pairing scheme** that was launched in Brussels in May 2006 with the strong support of the European Commission and European Parliament.

Top left: Giles Chichester MEP, Lord Selborne FRS and Phillippe Busquin MEP at the Brussels launch of the MEP-Scientist Pairing scheme

www.royalsoc.ac.uk/scienceinsociety

>> Through its programme of public events, the Society stimulates the wider community's interest in science.

Almost all of the Society's **public events** are now **webcast** in either live or recorded format, and are available to view on demand in the Society's well-regarded and continually expanding online video archive at **www.royalsoc.ac.uk/live**. The Society introduced **podcasting** to increase access to its video archive, the first event to be podcast being the final Anniversary Address by Lord May of Oxford as President of the Royal Society. The address was subsequently downloaded more than 2,000 times.

Prize lectures delivered during the reporting period included: the **Clifford Patterson lecture** by Wilson Sibbett FRS; the **Crick lecture** by Daniel Wolpert; the **Rosalind Franklin lecture** by Professor Christine Davies; and the **Michael Faraday lecture** by Professor Frances Balkwill.

Top left: Professor Christine Davies
Top right: Professor Frances Balkwill

www.royalsoc.ac.uk/events

>> The Society works to build an inclusive culture in science, engineering and technology (SET).

The Society hosted the ***Maximising UK ASSETs conference*** run jointly by Athena and the Equality Challenge Unit in December 2005. These bodies work with UK universities to promote employment diversity in higher education. The conference brought together Vice-Chancellors, Pro-Vice Chancellors and their representatives from some 30 UK universities to tackle the under-representation of women, particularly at senior levels, in scientific disciplines in higher education. It identified a range of issues needing attention, including the establishment of targets to be explored by Athena in 2006. Athena is hosted and supported by the Society. In March 2006, Professor Dominique Langevin delivered the third **Royal Society Athena lecture** on the theme of surfactants, emulsions and foam.

The Society continued to raise the profile of women in SET through its **Rosalind Franklin Award** and its **Dorothy Hodgkin Fellowships** (see page 7), the latter providing career flexibility to scientists seeking to strike a balance between career, family and other commitments.

www.royalsoc.ac.uk/diversity

Left: Professor Julia Higgins, Mr Janez Potočnik and Lord Sainsbury

>> 2005 Descartes Prizes for research and science communication

The award ceremony for the 2005 Descartes Prizes took place at the Society in December, and featured the European Commissioner for Research Mr Janez Potočnik, Science Minister Lord Sainsbury, and Royal Society Foreign Secretary Professor Dame Julia Higgins FRS.

The Descartes Prizes are the European Union's highest awards for transnational scientific research and outstanding science communication. The latter is a 'prize of prizes' that is only open to winners of other European award schemes. Professor Andrew Lyne FRS and Sir John Pendry FRS were members of two of the five teams that shared the 1 million euro prize for research. The 250,000 euro communication prize was shared between five science communicators, one being Bill Bryson, winner of the Royal Society's Aventis Prize for popular science books in 2004.

www.royalsoc.ac.uk/descartes

>> Publishing cutting-edge scientific research

>> The Society publishes the latest scientific research in its seven high-impact scientific journals, which cover the physical and biological sciences, as well as the history and philosophy of science.

The Society launched its **revamped Publishing website** in December 2005. The site offers an improved experience to users, particularly with respect to enhanced navigation consistency and accessibility. It also provides authors, readers, subscribers and referees with specific gateways for accessing a wide range of information and resources, including the latest published research from the Society's journals, news items, and advice on subscribing and submitting articles.

www.pubs.royalsoc.ac.uk

The Society's journals continued to publish an impressive amount of cutting-edge science during the period. In January 2006, ***Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*** published a study that exploited extensive UK archives of solar radiation observations to investigate the way in which cloudiness is influenced by galactic cosmic rays. The study revealed that the chance of an overcast day decreases by 20% on days with low cosmic ray fluxes, with the greatest effect in clean marine air. The December 2005 issue of ***Proceedings of the Royal Society B: Biological Sciences*** published an account of the first-ever successful attempt to observe a live giant squid in the wild, thereby providing the first live images of a giant squid and reporting the only available data on the behaviour of this species.

Through its **scientific discussion meetings**, the Society provides a forum for the world's leading researchers to confer on novel, innovative and exciting areas of science. The papers are published subsequently in ***Philosophical Transactions of the Royal Society (A or B)***. (See page 21 for a full list of meetings held from 1 September 2005 to 31 March 2006.) A meeting of high poignancy took place in October 2005 on the theme of ***Extreme Natural Hazards***. The organisers were Professors Steve Sparks FRS and Herbert Huppert FRS, and the meeting brought together 260 researchers in the fields of engineering, earth sciences, meteorology, risk management and disaster reduction to discuss the role that science plays in understanding extreme natural hazards, as well as related topics such as prediction, forecasting, monitoring and technological innovations. The meeting's outcomes were discussed at a follow-up event by senior policymakers including the Government's Chief Scientific Advisor Sir David King FRS, Chief Scientist for the Department for International Development Sir Gordon Conway FRS and the Director of the US National Oceanic and Atmospheric Administration, Vice Admiral Conrad Lautenbacher.

Papers from the meeting were published in the August 2006 edition of ***Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences***.

www.pubs.royalsoc.ac.uk

Top right: Professors Herbert Huppert (left) and Steve Sparks

>> Encouraging research into the history of science

>> The Society welcomes historians and researchers from all disciplines in the scholarly use of its unique collections. These include manuscripts, printed books and paintings, which together provide a continuous record of scientific advances and achievements over more than 345 years.

The Society secured a major coup in March 2006 with the acquisition of the long-lost **Hooke Folio** through a private treaty (see also page 17). The manuscript, which resurfaced unexpectedly in the cupboard of a Hampshire house in September 2005, contains accounts of the Society's first scientific research, as documented by Robert Hooke FRS (1635–1703). The folio consists of two bodies of original writing – detailed notes taken by Hooke following the death of the first Secretary of the Society, Henry Oldenburg, and Hooke's own rough notes of meetings of the Society for the period 1678–82 when he acted as Secretary. The Society hopes that new techniques, such as infrared scanning, will reveal 'secret' comments and paragraphs written in the fragile pages, which at some point were erased by Hooke – or someone else. These comments are expected to shed light on Hooke's fierce rivalries with his contemporaries and give an insight into the mind of a pioneer of Britain's scientific revolution.

The Andrew W Mellon project to catalogue existing archive collections was completed in late October 2005, and is delivering much-improved access to the Society's collections. The archive catalogue now exceeds 95,000 records, and the resource is growing each month. New cataloguing has included Engineering (War) Committee papers 1914–1918, James Sowerby's letters on early 19th century botany and letters of Walter White, assistant secretary to the Royal Society in the mid 19th century. In addition to these text-based materials, cataloguing of the Maull Studio's photographic portraits of Victorian Fellows was completed. This catalogue comprises 600 entries with associated images.

The Society participated in the **2005 Young Cultural Creators Scheme**, hosting a visit by a group of 15 Year 7 pupils from Westminster School in October 2005. Funded by Archives Libraries and Museums (ALM) London, the scheme engages young people with archives, artwork and museum collections to help them develop their creative potential. Facilitators are well-known children's authors or illustrators. During their visit, Westminster pupils met author and illustrator Michael Cox and explored the Society's archives for material relating to their chosen project topic of volcanoes and eruptions. The pupils went on to produce a range of inspired interpretations that were showcased in a celebration event at City Hall in December 2005.

Top right: Author Michael Cox working with Westminster School students in the Society's library

www.royalsoc.ac.uk/library

>> Unlocking the Hooke folio's secrets

With assistance from the Centre for Editing Lives and Letters (CELL), based at Queen Mary, University of London, the Hooke folio is now being transcribed, digitised and studied with a view to unlocking the secrets of this new primary record of the beginnings of the modern scientific era. Professor Lisa Jardine, biographer of Hooke and Director of CELL, is working with the Society to undertake the lengthy process of preservation and analysis.

'I can honestly say that this is the most important manuscript discovery of the past 50 years.The Hooke manuscript is the missing piece in the historical jigsaw puzzle. Its return completes the historical records of the Royal Society and provides a fascinating window on the origins of modern scientific practice,' Professor Jardine said.

>> Summarised financial statements

>> The financial information given here is a summary extracted from the Society's audited financial statements for the year ended 31 March 2006, which was approved by its Council on 6 July 2006.

The Auditor's report was unqualified. A copy of the financial statements will be submitted to the Charity Commission.

>> Independent Auditor's Statement to the Fellowship of the Royal Society

We have examined the summarised financial statements of the Royal Society.

On behalf of the Trustees
Sir David Wallace, Treasurer
20 September 2006

The summarised financial information may not contain sufficient detail to allow for a full understanding of the Society's financial affairs. For further information, the full annual financial statements, the Auditor's report on those financial statements and the Trustees' report should be consulted. Copies of these can be obtained from the Society at 6–9 Carlton House Terrace, London, SW1Y 5AG.

This statement is made solely to the Council of the Society, as a body in accordance with the terms of our engagement. Our work has been undertaken so that we might state to the Council members those matters we have agreed to state to them in this statement, and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the Council members (as trustees) for our work, for this statement, or for the opinions we have formed.

Respective responsibilities of trustees and auditors

The Council members are responsible for preparing the summarised financial statements in accordance with the recommendations of the Statement of Recommended Practice, Accounting and Reporting for Charities.

Our responsibility is to report to you our opinion on the consistency of the summarised financial statements with the full financial statements and Trustees' report. We also read the other information contained in the summarised annual report and consider the implications for our report if we become aware of any apparent misstatements or material inconsistencies with the summarised financial statements.

Basis of opinion

We conducted our work in accordance with Bulletin 1999/6, The Auditor's statement on the Summary Financial Statements, issued by the Auditing Practices Board for use in the UK.

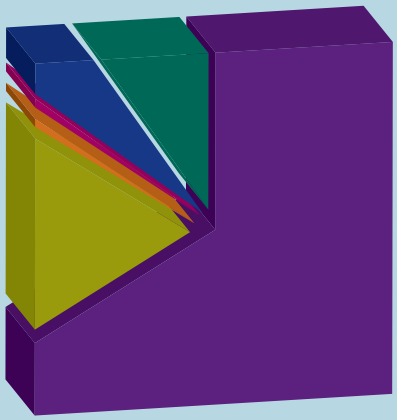
Opinion

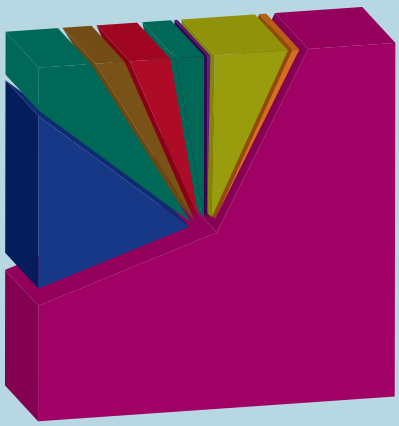
In our opinion, the summarised financial statements are consistent with the full financial statements and the Trustees' report of the Royal Society for the year ended 31 March 2006.

PKF (UK) LLP
Registered auditors
London, UK
20 September 2006

>> Balance Sheet

As at 31 March 2006, the net assets of the Society were £139,102k.





Income	£'000
Parliamentary Grant-in-Aid	32,899
Other grants for activities	8,771
Fellows' contributions	185
Donations and legacies	359
Investment income	2,452
Publications and services	4,553
Total	**49,219**

Expenditure	£'000
Support for individuals and the funding of research	30,160
International collaboration between the UK and the rest of the world	7,745
Science communication and education, dialogue with the public	2,780
Independent advice nationally and internationally	1,067
Scholarship, research into the history of science and other expenditure	1,750
Governance	1,226
Fundraising	175
Publications and services	3,318
Investment management	156
Total	**48,377**

>> Fundraising and support

>> Generous contributions from companies, trusts, Fellows and friends are essential to the Society's work as a champion for science, enabling it to maintain its independence and its standards of excellence.

The remarkably generous and swift outpouring of support that enabled the return of the Hooke folio (see also page 13) to the Society's archives was a high point for the Society's fundraising effort. More than 150 Fellows, friends and organisations contributed, including the Wellcome Trust, which provided a dramatic major grant in the days before the folio was due to go to auction. Buoyed by the success of the campaign led by Royal Society President Martin Rees, the folio was secured by private treaty only minutes before it was due to be auctioned on 28 March 2006. Significant additional support was also provided to preserve and study, and present these important papers to historians, students, teachers and the general public.

The Society went on to host a themed reception in May 2006 to celebrate the folio's return and to thank the many supporters who made this possible. The reception also marked the first public display of the volume.

The acquisition of the Hooke folio capped a busy and dynamic period for the Society's Development operation, which has been expanded to support the **major fundraising campaign** that is being mounted in preparation for the Society's 350th anniversary in 2010. The campaign has the three broad goals of ***advancing science education, supporting future scientific leaders*** and ***bringing impartial science advice to bear on global challenges***. Ultimately, it aims to expand the Society's endowment and strengthen its independence and ability in its role as a champion for UK science.

The Society is pleased to welcome new donors whose support has enabled it to initiate timely new initiatives, and remains grateful to its long-standing donors whose generosity has made a significant and lasting impact on its work. Private philanthropic support allows the Society to be flexible in both meeting the needs of the scientific community and maximising the benefits of science to the public.

With the support of new corporate and foundation donors, the Society launched two new prizes during the reporting period: the **Royal Society Pfizer Prize**, which is designed to reward scientists working in the UK or Africa at the outset of their careers and to promote scientific capacity building in the developing world; and the **Royal Society/Académie des Sciences Microsoft European Science Award**, sponsored by Microsoft Research, which is designed to recognise and reward scientists working in Europe who have made a major contribution to the advancement of science through the use of computational methods.

The Alfred P. Sloan Foundation has awarded the Society a grant to organise a workshop on scientific and technological developments relevant to the Biological and Toxin Weapons Convention. The Wellcome Trust is also supporting this initiative.

In addition to these and other grants, the Society continues to benefit tremendously from the generosity of donors who name the Society in their wills. A complete list of the Society's funding partners appears overleaf.

www.royalsoc.ac.uk/fundraising

>> List of donors

The Society gratefully acknowledges the generosity of individuals and organisations who have contributed during the period 1 September 2005 – 31 March 2006.

Trusts and Foundations

EP Abraham Cephalosporin Fund
Aventis Foundation
The Daiwa Anglo-Japanese Foundation
The Darwin Trust of Edinburgh
The Gatsby Charitable Foundation
The Kohn Foundation
The Leverhulme Trust
Andrew W Mellon Foundation
The Salters' Company
Sino-British Fellowship Trust
John Templeton Foundation
Wellcome Trust
Welton Foundation
The Wolfson Foundation
KC Wong Education Foundation

Companies

AstraZeneca plc
BP plc
GlaxoSmithKline plc
National Grid plc
Oxford University Press
Rolls-Royce plc

Organisations

Christ Church, Oxford
Institute of Computational Cosmology, Durham University
New College, Oxford

Individuals

Professor Jan Anderson FRS
Professor Janis Antonovics FRS
Sir Michael Atiyah OM HonFREng FRS
Professor John Baldwin FRS
Professor Grigory I Barenblatt ForMemRS
Professor Laurence Barron FRS
Mr John Bentley
Professor Peter Biggs CBE FRS
Professor Tim Birkhead FRS
Dr Tim Bliss FRS
Sir Walter Bodmer FRS
Professor Gustav Born FRS
Professor Martin Bott FRS
Professor Keith Bowen FREng FRS
Professor Michael L Brown FRS
Mr Bill Bryson
Professor Philip Burke CBE FRS
Professor Ian Butterworth CBE FRS
Professor Robert Cahn FRS
Professor Robin Carrell FRS
Professor Lorna Casselton FRS
Dr Allan Chapman
Professor Brian Charlesworth FRS
Professor Deborah Charlesworth FRS
Sir John Chisholm
Professor David Clarke FREng FRS
Professor Ted Cocking FRS
Professor Edward Corrigan FRS
Mr Peter Coulson
Dr Lionel Crawford FRS
Mr Michael Crowley-Milling CMG
Dr Richard Crowther FRS
Professor Durward Cruickshank FRS
Professor J Leonard Culhane FRS
Professor Anthony Cullis FRS
Professor Alan Cuthbert FRS
Sir Partha Dasgupta FRS
Mr Hugh Davies
Professor DT Delpy FRS
Professor Athene Donald FRS
Professor Dianne Edwards CBE FRS
Professor Geoffrey Eglinton FRS
Professor Harry Elliot CBE FRS
Sir Roger Elliott FRS
Professor Brian Eyre CBE FREng FRS
Professor Rod Flower FRS
Sir Hugh Ford FREng FRS
Professor Richard Fortey FRS
Ms Gillian Foulger
Professor Chris Frith FRS
Professor Uta Frith FRS
Professor Geoffrey Fryer FRS
Professor Gary Gibbons FRS
Professor Chris Graham FRS
Professor Peter Gray FRS
Professor Brian Greenwood CBE FRS
Professor Geoffrey Greenwood FREng FRS
Professor John Guest FRS
Sir John Gurdon FRS
Professor Herbert Gutfreund FRS
Professor Bryan Harrison CBE FRS
Dr Adam Hart-Davis
Mr Peter Hayes
Professor Walter Hayman FRS
Dame Julia Higgins DBE FREng FRS
Professor Douglas Higgs FRS
Mr Peter Hingley
Sir David Hopwood FRS
Sir John Horlock FREng FRS

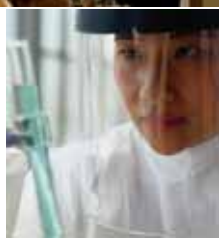
Sir Andrew Huxley OM FRS
Sir David Jack CBE FRS
Professor Patricia Jacobs OBE FRS
Professor Thomas Jessell FRS
Dame Louise Johnson DBE FRS
Mr Colin Jones
Professor Carole Jordan FRS
Professor Philip Kocienski FRS
Sir John Krebs FRS
Professor Michael Lappert FRS
Professor William Levick FRS
Professor Steven Ley CBE FRS
Professor Lewis Mander FRS
Dr Eric Mansfield FREng FRS
Sir Ian McGregor FRS
Sir Tom McKillop FRS
Professor Keith McLauchlan FRS
Professor Tom Meade CBE FRS
Professor Bob Michell FRS
Ms Sarah Miller
Professor Timothy Mitchison FRS
Mr Keith Moore
Professor John Murrell FRS
Professor Frank Nabarro MBE FRS
Professor Ron Newman FRS
Professor John Newsom-Davis CBE FRS
Sir Paul Nurse FRS
Mr Peter Nye FRS
Dame Bridget Ogilvie DBE FRS
Professor John RA Pearson FRS
Sir Michael Pepper FRS
Professor Mark Pepys FRS
Mr Martin Perkins
Professor John Pickett CBE FRS
Dr John Polkinghorne KBE FRS
Sir Ghillean Prance FRS
Professor Peter Pusey FRS
Professor Benton Rabinovitch FRS
Dr Donald Ramsay CM FRS
Miss Jenny Ramsden
Professor John Raven FRS
Professor Charles Rees CBE FRS
Professor Osmund Reynolds CBE FRS
Sir Rex Richards FRS
Professor John Ringrose FRS
Dr E A Robson
Dr John Rowell FRS
Sir John Rowlinson FREng FRS
Professor Ian Shanks FREng FRS
Professor David Sherrington FRS
Professor Roger Short FRS
Professor Bernard Silverman FRS
Professor Robert Simmons FRS
Professor Harry Smith CBE FRS
Professor Anthony Spencer FRS
Mrs Margaret Stanley
Mr Hugh Stevenson
Professor Marshall Stoneham FRS
Professor Trevor Stuart FRS
Sir John Sulston FRS
Professor Edwin Taylor FRS
Professor John C Taylor FRS
Professor Martin Taylor FRS
Professor David Thouless FRS
Mr George Tranda
Dr David Trentham FRS
Judge Mary Wakem
Professor David Walker FRS
Sir David Wallace CBE FRS
Professor Elizabeth Warrington FRS
Professor John Waterlow CMG FRS
Professor Alan Watson FRS
Professor Colin Webb MBE FRS
Professor Bryan Webber FRS
Professor Robin Weiss FRS
Professor John Westcott FREng FRS
Professor Gerald Westheimer FRS
Professor William Whelan FRS
Professor Peter Whittle FRS
Professor Robert Williams CBE FRS
Ms Carol Willock
Sir Martin Wood OBE HonFREng FRS
Mr Dennis Woodman
Professor Ian R Young OBE FREng FRS
Sir Christopher Zeeman FRS

The Society also wishes to acknowledge all donations that have been made anonymously.

Legacies

Sir Alan Hugh Cook FRS
Mrs Gladys Jessie Crowley-Milling
Sir Frederick William Page CBE FRS
Rink Bequest

>> Highlights
1 September 2005 – 31 March 2006



>> September

Scientific discussion meeting
> *Major steps in cell evolution: paleontological, molecular and cellular evidence of their timing and global effects*

Published report
> *Personalised medicines: hopes and realities*

>> October

Public events
> *Einstein vs Newton*, a panel discussion chaired by Marcus Du Sautoy and featuring Jim Al-Khalili, John Enderby FRS, Patricia Fara and Mark Lythgoe

> ***Clifford Patterson lecture**, Optical science in the fast lane* by Wilson Sibbett FRS

Scientific discussion meetings
> *Evolution of the Antarctic ice sheet: new understanding and challenges*

> *Extreme Natural Hazards*

>> November

Public events
> *The Roots of* The Royal *and the Scottish connection*, by John Gribbin

> *Measuring our future: the role of sustainability metrics*, by Richard Darton

Scientific discussion meeting
> *Catalysis by enzymes – beyond the transition state theory paradigm*

Anniversary Day
> Anniversary of the founding meeting of the Royal Society, including the President's Anniversary Address and the presentation of the Society's medals, awards and prize lectures

>> December

Public events
> ***Crick lecture**, The puppet master: how the brain controls the body*, by Daniel Wolpert

> ***Rosalind Franklin lecture,** The quandary of the quark*, by Christine Davies

Scientific discussion meeting
> *New directions in liquid crystal science*

Conference
> *Maximising UK ASSETs*, hosted by the Royal Society in partnership with the Equality Challenge Unit, which works with UK universities to promote employment diversity in higher education

>> January

Public events
> ***Michael Faraday lecture**, A silent killer?* by Professor Frances Balkwill

> *Cosmic Africa*, a public lecture delivered by Dr Thebe Medupe as part of *South Africa Day*

Top right: Dr Thebe Medupe

Scientific discussion meeting
> *Physics, chemistry and the astronomy of H3+*

Published report
> *The long-term management of radioactive waste: the work of the Committee on Radioactive Waste Management*

>> February

Scientific discussion meeting
> *Conditions for the emergence of life on the early Earth*

Published report
> *Response to the Stern Review on the economics of climate change*

>> March

Public events
> ***Leeuwenhoek lecture**, Microscopy goes cold: Frozen viruses reveal their structural secrets,* by Tony Crowther FRS

> ***Royal Society Athena lecture**, Surfactants, emulsions and foams*, by Professor Dominique Langevin

Scientific discussion meeting
> *Species and speciation in micro-organisms*

Conferences
> *Increasing science uptake post-16*, organised by the Royal Society

> *Making Mathematics Count – Two years on*, organised by the Advisory Committee on Mathematics Education (ACME)

Webcast available at www.royalsoc.ac.uk/webcasts

Podcast available at www.royalsoc.ac.uk/podcasts

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www.royalsoc.ac.uk

The Royal Society has three roles: as the UK academy of science, as a learned society and as a funding agency. It responds to individual demand with selection by merit, not by field.

The objectives of the Royal Society are to:

- strengthen UK science by providing support to excellent individuals
- fund excellent research to push back the frontiers of knowledge
- attract and retain the best scientists
- ensure the UK engages with the best science around the world
- support science communication and education, and communicate and encourage dialogue with the public
- provide the best independent advice nationally and internationally
- promote scholarship and encourage research into the history of science.

Issued: October 2006
Founded in 1660, the Royal Society is the independent scientific academy of the UK, dedicated to promoting excellence in science

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