



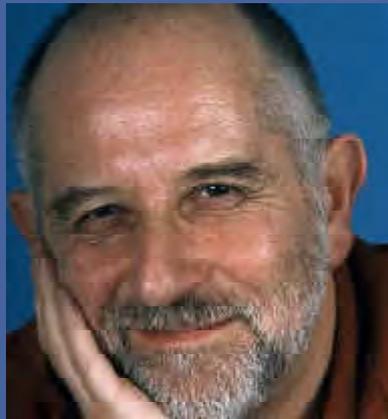
# RESOURCE

THE NEWSLETTER OF SCOTLAND'S NATIONAL ACADEMY

Evelyn Glennie. Image by Mark Harrison, Good Housekeeping



Sir Michael Berry. Image supplied by M Berry



Sir David Attenborough. Image courtesy of Scotsman Publications.



Mona Siddiqui. Image courtesy of University of Glasgow



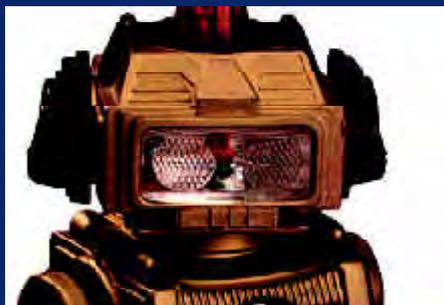
## Breadth of Expertise for Public Benefit Increases

More than sixty outstanding individuals have been elected to Fellowship of the Society. Chosen in recognition of outstanding contributions to their fields and achievement in public service, a broad spectrum of expertise is represented in the new list of Fellows. Writer and Broadcaster, David Attenborough; Musician, Evelyn Glennie; Minister of St. Giles, Gilleasbuig MacMillan; Islamic Scholar, Mona Siddiqui; and Scottish Art Historian, Duncan MacMillan, are among the top achievers who will join the Fellowship of the RSE.

Following elections held at the Society's George Street headquarters on the evening of Monday 7 March 2005, Michael Porter, a global-authority on competitive strategy; John McCarthy, the Co-founder of Artificial Intelligence; Michael Berry, one of the world's most famous Theoretical Physicists; and Elizabeth Loftus, internationally-renowned expert on 'Eyewitness' Recall', have also become Fellows of the RSE. This year's cohort of newly-elected Fellows includes eminent Medical and Biological Scientists; top Engineers, Patricia Connolly and Anne Neville; and Business Leaders, including: Duncan Michael, Alison Goligher, Bob Reid, Jeremy Peat, and George Borthwick.



Young People to discuss  
Climate Change



The Robot in Your Head  
4 April 2005



Image by Michael Kenward

President-elect on board

# Election 2005

The President of The Royal Society of Edinburgh, Lord Sutherland of Houndwood said:

*Whether household names or mainly admired within their own speciality, all of the individuals elected to Fellowship are united in having reached an outstanding level of achievement in their fields. We recognise and celebrate their hard work, dedication and success. The RSE will be seeking to harness their wisdom, experience and energy to help deliver the aims of the Society and in turn to be of further public benefit to Scotland.*

## HONORARY FELLOWS

**ATTENBOROUGH**, David F. Freelance Writer and Broadcaster,

**BERRY**, Michael V. Royal Society Research Professor, University of Bristol

**MCCARTHY**, John. Professor Emeritus of Computer Science, Stanford University

**PORTER**, Michael E. Bishop William Lawrence University Professor, Harvard Business School



Dr Alison Goligher. Image supplied by A Goligher.

The Royal Society of Edinburgh (RSE) is Scotland's National Academy of Science & Letters. It is an independent body with charitable status. The Society organises conferences and lectures for the specialist and for the general public. It provides a forum for informed debate on issues of national and international importance. Its multidisciplinary fellowship of men and women of international standing provides independent, expert advice to key decision-making bodies, including Government and Parliament.

The Society's Research Awards programme annually awards well over £1.5 million to exceptionally talented young academics and potential entrepreneurs to promote commercial exploitation of inventiveness and boost wealth-generation.

Among its many public benefit activities, the RSE is active in classrooms from the Borders to the Northern Isles, with a successful programme of lectures and hands-on workshops for primary and secondary school pupils.

The Royal Society of Edinburgh, working as part of the UK and within a global context, is committed to the future of Scotland's social, economic and cultural well-being.

## FELLOWS

**ALLSHIRE**, Robin C. Wellcome Trust Principal Research Fellow and Professor of Chromosome Biology, University of Edinburgh

**ANDERSON**, Robert D. Professor of Modern History, University of Edinburgh

**ARCHIBALD**, Alan L. Head of Division/ Head of Genetics and Genomics, Roslin Institute (Edinburgh); Honorary Professor, University of Edinburgh

**BERRY**, Christopher J. Professor of Political Theory, University of Glasgow

**BICKMORE**, Wendy A. MRC Senior Scientist, Western General Hospital

**BLACK**, Susan M. Professor of Anatomy and Forensic Anthropology, University of Dundee

**BORTHWICK**, George C. Chairman: Tayside Flow Technologies; Nova Science Ltd; Scottish Business in the Community. Vice Chairman, Court of Napier University.,

**BOWER**, (D) Jane. Chair in Entrepreneurship, Glasgow Caledonian University

## CORRESPONDING FELLOWS

**ASHENFELTER**, Orley C. Joseph Douglas Green 1895 Professor of Economics, Princeton University

**CHISHOLM**, Malcolm H. Distinguished Professor of Mathematical and Physical Sciences, Ohio State University

**FREY**, Bruno S. Professor of Economics and Director, Institute of Empirical Economic Research, University of Zurich

**GORDON**, Cameron M. Sid W. Richardson Foundation Regents Chair in Mathematics, University of Texas

**HELLE**, Knut. Professor Emeritus of Medieval History, University of Bergen

**LOFTUS**, Elizabeth. Distinguished Professor of Psychology and Social Behaviour, Criminology, Law and Society, University of California, Irvine

**STEINMAN**, Ralph M. Henry G Kunkel Professor and Senior Physician, The Rockefeller University

**BROWN**, Alistair J P. Professor in Molecular and Cell Biology, University of Aberdeen

**BRUCE**, Steve. Professor of Sociology and Head of School of Social Science, University of Aberdeen

**CANTRELL**, Doreen A. Wellcome Principal Research Fellow and Head of Division of Cell Biology and Immunology, University of Dundee

**CATES**, Michael E. Professor of Natural Philosophy, University of Edinburgh

**CHAPMAN**, Stephen K. Professor and Head of School of Chemistry, University of Edinburgh

**CONNOLLY**, Patricia. Professor of Bioengineering and Director, Medical Devices Doctoral Training Centre, University of Strathclyde

**COWAN**, Edward J. Professor of Scottish History, University of Glasgow

**DOYLE**, Anthony. Professor of Physics, University of Glasgow



Professor Michael Porter. Image courtesy of Harvard Business School.

**FINDLAY**, Allan M. Professor of Population Geography and Director of the Centre for Applied Population Research, University of Dundee

**GIBBY**, Mary. Director of Science, Royal Botanic Garden

**GLENNIE**, Evelyn. Professional Musician

**GLOVER**, (L) Anne. Personal Chair in Molecular Biology, University of Aberdeen

**GOLIGHER**, Alison J P. Vice President of Production, Schlumberger Integrated Project Management, Schlumberger Oilfield Services

**GOUDIE**, Andrew W. Chief Economic Adviser to the First Minister; Head of Finance and Central Services Dept, The Scottish Executive

**GYONGY**, Istvan. Professor of Probability, University of Edinburgh

**HANCOCK**, John W. Professor of Mechanical Engineering and Dean of the Faculty of Engineering, University of Glasgow

**IRVINE**, John T S. Professor of Inorganic Chemistry, University of St Andrews

**JOHNSTONE**, Eve C. Professor of Mental Health and Psychiatry and Head of Division of Psychiatry, University of Edinburgh

**JOWITT**, Paul W. Professor of Civil Engineering Systems and Executive Director, Scottish Institute of Sustainable Technology, Heriot-Watt University

**KEATING**, Michael J. Professor of Politics, University of Aberdeen and European University Institute

**KEIGHTLEY**, Peter. Professor of Evolutionary Genetics, University of Edinburgh

**KNOX**, Andrew R. Technical Staff Member, IBM(UK) Ltd; Visiting Professor, University of Glasgow

**LEIGH**, David A. Forbes Chair of Organic Chemistry, University of Edinburgh

**McKINNON**, Kenneth. Professor of Operational Research, University of Edinburgh

**McLEAN**, (W H) Irwin. Professor of Human Genetics; Wellcome Trust Senior Research Fellow and Honorary Clinical Scientist, University of Dundee

**MacMILLAN**, Gilleasbuig I. Minister of St Giles Cathedral, Edinburgh

**MacMILLAN**, (J) Duncan. Art Critic, *The Scotsman*, Emeritus Professor, University of Edinburgh

**MacPHAIL**, Ian D. Senator of the College of Justice, Parliament House

**MANNING**, Susan L. Grierson Professor of English Literature and Director, The Institute for Advanced Studies in the Humanities, University of Edinburgh

**MEHARG**, Andrew A. Professor of Biogeochemistry, University of Aberdeen

**MICHAEL**, Duncan. Trustee, Arup Group; Board Member, The Housing Corporation,

**MILLAR**, Alan. Professor of Philosophy, University of Stirling

**MURRAY**, Gordon D. Professor of Medical Statistics, University of Edinburgh

**NAISMITH**, James H. Professor of Chemical Biology, University of St Andrews

**NASH**, Anthony A. Professor of Veterinary Pathology and Head of Division of Veterinary Biomedical Sciences, University of Edinburgh

**NEVILLE**, Anne. Professor of Tribology and Surface Engineering, University of Leeds

**PEAT**, Jeremy A. Group Chief Economist, Royal Bank of Scotland; BBC Governor for Scotland; Vice-Chair, SHEFC, Royal Bank of Scotland

**PROSSER**, James I. Personal Chair in Microbiology, University of Aberdeen

**RALSTON**, Stuart H. ARC Professor of Rheumatology, University of Edinburgh

**REID**, Robert P. Director: CHC Helicopter Corp, Foundation for Young Musicians, Merchants Trust plc, Siemens Holdings plc, Intercontinental Exchange Services UK, IPE Charitable Trust, Sun Life Assurance Company of Canada (UK) Ltd. Chairman: Edinburgh Business School, International Petroleum Exchange of London, Conservatoire for Dance and Drama, Learning through Landscapes, Milton Keynes Partnership Committee

**ROTTER**, (M) John. Professor of Civil Engineering, University of Edinburgh

**SAVILL**, John S. Professor of Medicine, Vice-Principal and Head of College, University of Edinburgh Medical School

**SCOTT**, (E) Marian. Professor of Environmental Statistics, University of Glasgow

**SIDDIQUI**, Mona. Senior Lecturer in Arabic and Islamic Studies and Head of Department of Theology and Religious Studies, University of Glasgow

**TAYLOR**, Garry L. Professor of Molecular Biophysics and Director of the Centre for Biomolecular Sciences, University of St Andrews

**WADLER**, Philip L. Professor of Theoretical Computer Science, University of Edinburgh

**WEBSTER**, John B. Professor of Systematic Theology, University of Aberdeen



Professor Anne Neville. Image supplied by University of Leeds

# President-elect



Lord Sutherland of Houndwood (left) with Sir Michael Atiyah. Photo by Gary Doak.

## Abel Prize Winner to be next RSE President

One of the world's greatest living mathematicians is to be the next President of The Royal Society of Edinburgh.

Sir Michael Atiyah will take over as RSE President when Lord Sutherland demits office this October. Atiyah will be only the second person ever to have been sometime President of both The Royal Society of Edinburgh and The Royal Society in London – the first being Lord Kelvin.

The highly prestigious post of RSE President has been held by other such distinguished figures as Sir James Hall, Sir Walter Scott and Thomas Stevenson.

The post is unpaid; the term lasts for 3 years and always provides a 6-month period of overlap for the incoming and outgoing Presidents.

The current President of The Royal Society of Edinburgh, Lord Sutherland of Houndwood, KT, FBA, PRSE, who remains in office until October 2005, said:

*I am delighted that Sir Michael has been made President-elect. He is a highly distinguished individual whose wisdom and global-perspective will be greatly appreciated by the Society as it further expands its international activities and develops its range of public-benefit activities in Scotland. Sir Michael has a wealth of experience to offer and will be an outstanding leader of, and ambassador for, Scotland's National Academy of Science and Letters.*

### Sir Michael Atiyah OM, PPRS, HonFRSE

Sir Michael Atiyah has had a profound and beneficial effect on the development of mathematics and science in the UK and Europe.

He was one of the pioneers in the development of K-theory. Knighted in 1983, he received the Order of Merit in 1992, was Master of Trinity College Cambridge from 1990 to 1997 and held the position of President of The Royal Society of London from 1990 to 1995. He was elected to Fellowship of The Royal Society of London at the notably young age of 32.

Sir Michael was recently President of Pugwash and is Chancellor of the University of Leicester.

The Norwegian Academy of Science and Letters awarded the Abel Prize, regarded as the 'Mathematicians' Nobel' jointly to Sir Michael and Isadore M. Singer, Massachusetts Institute of Technology, in 2004. The Abel prize was awarded for "their discovery and proof of the index theorem, bringing together topology, geometry and analysis, and their outstanding role in building new bridges between mathematics and theoretical physics."

In 2003 Sir Michael was presented with The Royal Medal of the Royal Society of Edinburgh, by HRH The Duke of Edinburgh, in recognition of intellectual endeavour which has had a profound influence on people's lives, world-wide.

President-elect of The Royal Society of Edinburgh, Sir Michael Atiyah OM, PPRS, HonFRSE said:

I am honoured and delighted to have been elected as the next President of the Royal Society of Edinburgh. Lord Sutherland will be a hard act to follow. Under his leadership the RSE has taken many new initiatives and made itself a more visible part of the Scottish community. I will do my best to see that the RSE continues to build on its long and distinguished history and widens its role in the new Scotland.

# Alan Greenspan, Hon.KBE



Sir Alan Greenspan, with bust of Adam Smith

Honorary Fellowship of The Royal Society of Edinburgh has been bestowed upon the internationally renowned economist and Chairman of the Board of Governors of the Federal Reserve, Dr. Alan Greenspan Hon. KBE. The Society's President, Lord Sutherland of Houndwood KT, FBA, PRSE admitted Dr Greenspan to Honorary Fellowship at a ceremony in St. Bryce Kirk, Kirkcaldy, following the Bank of Scotland Adam Smith Lecture held on Sunday February 6. The citation was prepared and read by the distinguished economist and RSE Vice President, Professor Gavin McCrone, CB, FRSE. Dr Greenspan delivered the Adam Smith lecture at the invitation of the Chancellor of the Exchequer, Gordon Brown, MP who introduced Dr Greenspan.

The President of The Royal Society of Edinburgh, Lord Sutherland of Houndwood, KT, FBA, PRSE said:

*I am delighted to have had the opportunity to confer Honorary Fellowship of The Royal Society of Edinburgh upon Dr Alan Greenspan. An economist of world renown, it is fitting that the ceremony took place in Kirkcaldy, birth place of one of the Society's Founder Members, Adam Smith, whose influence upon economics and philosophical thinking has become legend the world over. Dr Greenspan is the longest serving and, by common consent, the most successful Chairman in US history. It is*

## Honorary Fellow Treads in Footsteps of Adam Smith

*for his outstanding contribution to economic policy that the Royal Society of Edinburgh awards him an Honorary Fellowship. His willingness to accept and the time and effort devoted to his fascinating speech, does great credit to the Society.*

Dr Greenspan is the principal authority on and key participant in United States' economic policy, affecting UK trade and the global economy and is in his fifth term as Chairman of the Board of Governors of the Federal Reserve System. He first took office in August 1987 and has been designated Chairman by Presidents Reagan, Bush, Clinton, and Bush. He has presided over the recovery of 1988-94; the low inflation boom of 1994-2001; dramatic reductions in public sector deficits; and recession/recovery since 2001. His term of office will end in January 2006. In being admitted to Fellowship Dr Greenspan joins the ranks of Honorary Fellows of the RSE, who have included such eminent figures as Benjamin Franklin, Faraday, Carlyle, Tennyson, Huxley, John Stuart Mill, and the Nobel Prize winner and inventor of the Silicon chip, Jack Kilby. Today the RSE's multidisciplinary Fellowship includes other outstanding economists such as Nobel Laureates, Professor Amartya Sen, FBA, and Sir James Mirrlees, FBA as well as Professor Sir Alan Peacock, DSC, FBA, FRSE.



Professor Gavin McCrone. Photos by George McLuskie. Courtesy of Fife College

### Dr Alan Greenspan, Hon. KBE, Hon.FRSE

Dr. Greenspan studied economics at New York University and obtained his PhD in 1977. From 1974 to 1977, he served as Chairman of the President's Council of Economic Advisers under President Ford, and from 1981 to 1983, was Chairman of the National Commission on Social Security Reform. Before his appointment to the Board in 1987, Dr. Greenspan had served as a corporate director for many companies including the Aluminum Company of America; J.P. Morgan & Co. and the Mobil Corporation. His non-corporate positions have included the Directorship of the Institute for International Economics. Dr Greenspan has also served as a member of President Reagan's Economic Policy Advisory Board, a member of Time magazine's Board of Economists, a senior adviser to the Brookings Panel on Economic Activity, and a consultant to the Congressional Budget Office. His previous Presidential appointments included the President's Foreign Intelligence Advisory Board, the Commission on Financial Structure and Regulation, and the Task Force on Economic Growth. Dr.Greenspan has received honorary degrees from many universities, including Harvard, Yale, Pennsylvania, and Notre Dame. His other honours include the Thomas Jefferson Award for the greatest public service performed by an elected or appointed official; election as a Fellow of the American Statistical Association; Commander of the Legion of Honour, and Honorary Knight Commander of the British Empire. Also he was the first recipient of the Gerald Ford Medal for Distinguished Public Service.

# International

## EU FORUM

A meeting, convened under the auspices of the RSE European Policy Forum and chaired by Sir David Edward, met to discuss ways of how Scotland could maximise its involvement in the Framework Programmes.

Representatives of most of the Scottish universities, research institutes and other interested organisations contributed to a wide-ranging discussion of some of the issues which were raised. Following the meeting, Sir David commented "The meeting was particularly timely as the RSE is preparing to welcome the new EU Commissioner for Research, Dr Janez Potocnik at the end of May. But it also demonstrated the urgent need for the Scottish research community to identify points of common interest and make its voice heard. The RSE's EU Forum provides an ideal context in which to do so".

Fellows will be kept informed of developments of the European Policy Forum and the Commissioner's visit.

## SCIENCE SCOTLAND

This publication features the best of science and technology in Scotland with the objective to raise awareness to an international audience, using the global networks of the partner organisations. It has been created by the Society, in partnership with the Scottish Executive, British Council Scotland and Scottish Development International. An editorial board, chaired by Professor John Coggins, has been set up to oversee the content of material. If your research group has a project of international standing to report, please send a brief summary to Michael White, using the following email address: [sciencescotland@royalsoced.org.uk](mailto:sciencescotland@royalsoced.org.uk).

If anyone wishes to receive copy of this publication, they should register on the dedicated website, [www.sciencescotland.org](http://www.sciencescotland.org) indicating the appropriate format for receipt.

## ACADEMY OF SCIENCES OF THE CZECH REPUBLIC

Developing closer relations with the national academies in EU Accession States is a priority activity for the RSE. Links with the Czech Republic were considerably strengthened when the RSE's International Convener, Professor Rona MacKie visited the Academy of Sciences of the Czech Republic in late December 2004 and met the President of the Academy, Professor Helena Illernová, and Professor Jirí Niederle, President of the Council for International Affairs.

Professor MacKie visited two of the Academy's research Institutes: the Institute of Molecular Genetics where she met its Director, Professor Václav Paces, and the Institute of Microbiology led by Professor Blanka Říhová.

Professor MacKie also visited the British Council in Prague as its varied programme of activities has a strong Scottish dimension.

Since the visit, a Memorandum of Understanding has been agreed with the Czech Academy and this will create additional opportunities for researchers in both countries to work together for mutual benefit.



Professor MacKie (left) with Professor Říhová.

## NORWEGIAN ACADEMY OF SCIENCE AND LETTERS

A delegation from the Norwegian Academy of Science and Letters visited the Royal Society of Edinburgh at the end of February. The delegation was led by Professor Reidun Sirevåg, the Academy's General Secretary. The delegation met with Senior Officers and Fellows of the Society to initiate ideas of working more closely together in the future. The annual joint RSE/Edinburgh Centre for Rural Research/Institute of Biology lecture given by Professor Ian Wilmut of the Roslin Institute rounded off the main part of their programme.

## RSE CHINA FORUM

The RSE China Forum was recently re-instated under the chair of Professor Stephen Blackmore FRSE, Regius Keeper of the Royal Botanic Garden Edinburgh. A productive meeting with several Scottish organisations who have links with China raised many suggestions for how the Forum members could work in synergy to create more of an impact.

Additional Forum members will be invited to join as occasional members.

## INTERNATIONAL EXCHANGE PROGRAMME

The International Exchange Programme provides opportunities for researchers (with at least post-doctoral status) from Scotland to travel on a short visit of up to 4 weeks to further research collaboration, and also for Scottish researchers to invite foreign colleagues to visit Scotland. Follow-up trips may be possible depending on the outcomes of the first visit made. There are three bilateral programmes; with the Chinese Academy of Sciences (to member institutes), the Polish Academy of Sciences and the National Science Council of Taiwan. There is also an Open programme to allow travel to other destinations, or to receive visiting researchers, not covered by the bilateral agreements. Further details on eligibility and application forms can be found on the Society's website: [www.royalsoced.org.uk](http://www.royalsoced.org.uk). Completed applications (including supporting documentation) must be submitted before the appropriate closing date each year (28 February, 31 May, 31 August and 30 November). You should allow at least 2 months after the closing date before travel. Please note that these International Exchange Programmes are open to all post-doctoral researchers in Scotland and not restricted to Fellows.

## BRAIN SCIENCE

Reports of the *Scotland in the Netherlands* Brain Science event, held in Amsterdam on 30 September - 1 October 2004 are being printed and can be obtained from the Society's offices. The report is also available on the RSE website.

## CONTACT US

Information on the RSE's international programme is available on the RSE website, [www.royalsoced.org.uk](http://www.royalsoced.org.uk) or from Michael White, [international@royalsoced.org.uk](mailto:international@royalsoced.org.uk)

Successful applicants who have returned from visits under the Exchange Programme include:

**Dr Andrej Pacak** from Poland, who was hosted by Dr Christophe Lacomme at the Scottish Crop Research Institute near Dundee. Reverse genetic approaches based on post-transcriptional gene silencing has opened up new possibilities to study gene function. Plant viruses trigger a form of post-transcriptional gene silencing, called virus induced gene silencing (VIGS) which leads to a homology-dependant degradation of the viral RNA. This visit evaluated the silencing efficacy of *Brome mosaic virus* and *Maize streak virus* in their ability to trigger a silencing response in different tissues. The development of an alternative *Maize streak virus* VIGS vector for silencing in maize and barley was initiated during this visit. The development of a tool for reverse genetics in monocots and high throughput functional characterisation of genes to ascertain their function *in planta* is one of the major challenges of the post-genomic era.

This area of research is competitive and such international collaborations are crucial to create European networks and will help in future funding applications.

**Dr Tobias Bast and Dr Stephen Martin**, University of Edinburgh, who made a trip to the Netherlands following on from the Brain Science Symposium held at the Royal Netherlands Academy of Arts and Sciences in October 2004. They were hosted by Professor Menno Witter at the Free University of Amsterdam Medical Centre. Their research involves experiments on learning and memory in rats in order to help unravel the function of the hippocampus - a brain structure implicated in the recollection of everyday events in humans. Their visit to Professor Witter's laboratory enabled them to refine their hypotheses concerning the functional significance of the longitudinal connections within the hippocampus, learn new techniques and to make plans for anatomical studies starting in 2005. Further visits and collaborations between the two institutions should result from this visit.

**Dr Kevin Murphy**, University of Glasgow, who visited Argentina and Brazil to draft research proposals and visit the proposed study areas, for a comparative international study which aims to develop a bio-monitoring methodology utilising community composition and functional attributes of aquatic macrophytes as bio-indicators of water quality, tailored to the needs of river basins in the southern part of South America. This proposed scheme is similar to those developed in Europe in response to the EC Water Framework Directive's requirements. As a result of this visit, two projects have been submitted under EC FP6 and another one is planned as a NERC proposal.



Macroinvertebrate sample processing at Barra Bonita, overlooking the Tiête River in Brazil. Photo: Dr Kevin Murphy

# HIV and AIDS in Scotland: Beyond the 1980s

A Discussion Forum

Wednesday 8 December 2004



**Neil Gerrard, MP, Chair of the All Party Group on AIDS** began the discussion by presenting an international overview of the AIDS pandemic. By the end of 2003 an estimated 53000 people were living with HIV in the UK. New diagnoses have been rising steadily since 1998. In the earlier years of the epidemic men who have sex with other men were consistently the largest group diagnosed, but since 1999 they have been outnumbered by infections acquired through heterosexual sex. The majority of the new heterosexual infections are believed to have been acquired in sub-Saharan Africa, but the trends are bad for virtually every group of people at risk of infection.

Although Africa is currently the centre of attention in relation to HIV, new epidemics are springing up. In Central and Eastern Europe and the Commonwealth of Independent States (mostly the former USSR) UNAIDS estimate as many as 280,000 people contracted the virus in 2003, bringing the total infected to as many as 1.8 million. This region includes several countries which are either EU members, or will be soon. The Russian Federation, Latvia, Ukraine and Estonia are experiencing some of the fastest growing HIV epidemics in the world. Injecting drug use is the main driver, but with an HIV prevalence rate approaching 1% of the population, Russia and other East European states, are at the point where this could tip over into a generalised epidemic. It is not only Eastern Europe where there are dangers. Approaching 5 million people are infected in India. China has a growing problem. In some of the worst affected countries the response so far to the epidemic has been at best

patchy and consequently policies to prevent HIV infections are poorly developed. The rise in heterosexual infections originating in countries outside the UK has led to calls for mandatory testing of those coming to settle or work in the UK, but such calls ignore the potential public health impacts and the effects on the individuals concerned.

HIV has devastating effects not just on health, but on the economy, on all public services, and on security. Can we sit back and ignore the possibility of these effects developing in the countries now starting to be seriously affected, or should we be doing all we can to help them address their problems?

**Dr Gordon Scott of the Genito Urinary Medicine Department at the Western General Hospital in Edinburgh** followed with a snapshot of HIV epidemiology in Scotland. The first case of HIV-related illness in Scotland was seen in 1983. Initially it was anticipated that our epidemiology would be similar to that seen in the USA and England, with gay men being affected predominantly. However, in early 1985 an Edinburgh virologist tested some samples from intravenous drug users (IDUs) attending health care facilities, and found to his surprise and horror that approximately 50% were positive.

In 1986, there were 257 new cases of HIV infection in Lothian, of whom 206 were IDUs. Most IDUs are heterosexual, and this led to significant numbers of cases being transmitted to sexual

partners and in some cases being passed to children at childbirth. Harm reduction interventions led to a dramatic fall in needle-sharing HIV transmission, and by the end of the 1980s, sexually transmitted cases of HIV predominated. Throughout the 1990s, the number of new cases of HIV diagnosed in Scotland each year was remarkably consistent at 150-180. However, in 2002 and 2003 there were 250 and 257 cases respectively, and in the first 9 months of 2005 there were 274 new cases. We now have a similar pattern to the rest of the UK, with the two major groups affected being gay men and those infected in Sub-Saharan Africa. Heterosexual acquisition in Scotland continues at low level, but currently there are almost no new cases acquired through drug use.

Advances in the management of HIV, such as antiretroviral therapy (ART), have now made this an eminently treatable condition, with life expectancy now measured in decades. ART use in pregnancy can also significantly reduce the risk of mother-to-child transmission (MTCT). Although these advances are available to those living in the developed world, most HIV-infected people worldwide have no access to ART. Our challenge now is to develop efficient services for the growing number of people living with HIV in Scotland, whilst offering all assistance to colleagues working in resource-poor settings.

The full text of this summary, written by Dr Richard Holloway, who chaired the meeting, can be found on the RSE website.

# Engineering and the Creative Arts: A New Frontier

The 2005 Royal Society of Edinburgh /  
Royal Academy of Engineering Lecture  
Friday 11 March 2005

Dr Robert Hawley, CBE, DSc, FEng, FRSE



*More than ever we need people who can lead humanity towards technology that improves society rather than technologies that simply improve our technology itself". John Maeda*

Dr Robert Hawley, formerly Chairman of the Engineering Council and of PPARC, and currently Deputy Chairman of the Foundation for Science and Technology gave a lecture at RSE on the growing need to educate engineers in the arts and humanities and the benefits to both disciplines of so doing.

"Undoubtedly there are already many areas where such collaboration is taking place, but much more needs to be done; not only at undergraduate level, but also at the many interfaces of engineering and the arts in order to produce the creative engineers and industries so vital to the future economy of the UK. In addition, those who study the arts and humanities need a basic understanding of science, as future developments will depend on partnerships between engineers and the users of the new technology.

It is a major step forward that the Arts and Humanities Research Board has been redesignated as the Arts and Humanities Research Council and will shortly take its place alongside the other Research councils under the Office of Science and Technology. This will include further cross-fertilisation between science, engineering, the arts and the humanities at the research level.

My purpose has been to highlight the need for more open, two-way, interactions between engineers and the arts and humanities and to celebrate some of the rich legacy of achievement on which we can build.

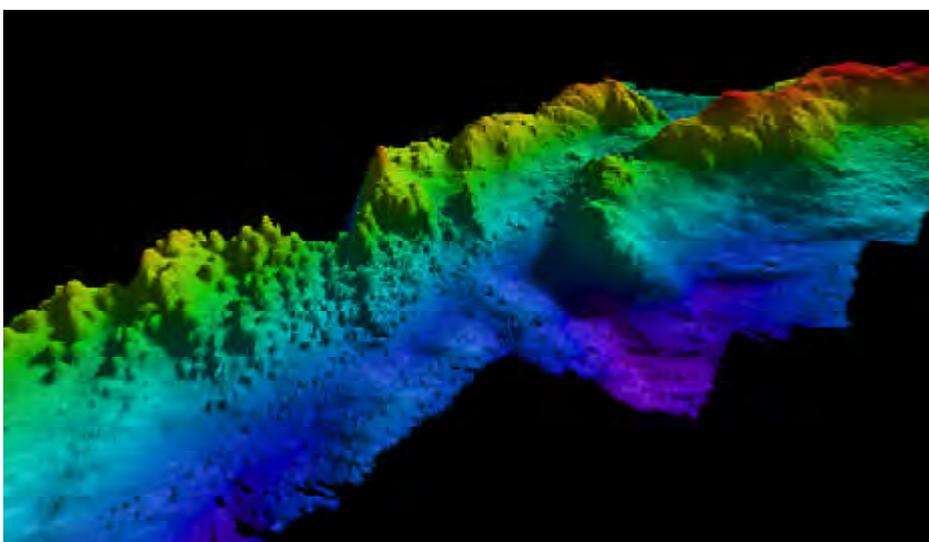
We have, however, a very serious conjunction of challenges; on the one hand, a growing awareness of the critical economic relevance of open bridges between arts/humanities and

engineering and the sciences; and on the other, a clear need for a more robust industry/university/Government programme to address both the attraction and creative content of educational provision for new entrants to the profession.

The situation urgently requires action to secure the future. I have taken an increasing role in the Creative Value Network and its *Janus Programme*, one part of which is to stimulate more arts/engineering interaction. It is named after the Roman God of the open door and I hope by means of this paper I have succeeded in opening the door wider."

Dr Hawley's complete paper is on the RSE website.

Image: *The Angel of the North* (above), courtesy of Gateshead Council



© MINCH project (Mapping INshore Coral Habitats). 3-D view from the multibeam survey of ridge features east of Mingulay Reef

## Europe's Hidden Coral Worlds

At a conference held at the RSE on 23 February, experts gathered to discuss the findings of the EU projects ACES, ECOMOUND and GEOMOUND which have brought together marine scientists from across Europe at a time when human exploitation of the European continental margin is increasing. These interdisciplinary studies are producing a better understanding of these environments that will help in the future conservation of long-lived and diverse ecosystems.

## FORTHCOMING EVENTS

TICKETS ARE REQUIRED FOR ALL RSE EVENTS. To book tickets online, visit [www.royalsoced.org.uk](http://www.royalsoced.org.uk) or contact [events@royalsoced.org.uk](mailto:events@royalsoced.org.uk) for further information.

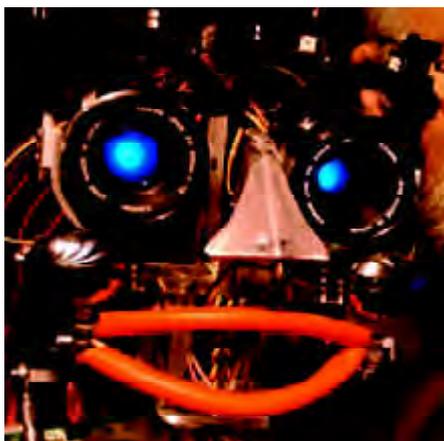
### APRIL 2005

**Monday 4 April at 5.30pm**

**\*\*LECTURE**

#### **The Robot in your Head**

Professor Noel Sharkey FIEE, Professor of Computer Science, EPSRC Senior Media Fellow, University of Sheffield



A lively walk through the history of robots and their relationship to animals. You will hear about the automata of the ancients (280 BC) and how they gradually developed into the robots of the 20th century. Following clips of Noel's favourite robots in the movies, we will examine the stark reality of the development of real robots today, illustrated by his public projects and museum exhibitions. Since the 17th century, the idea has become increasingly strong that we humans and other animals are mere machines or automata. But do you believe it? Are you a robot?

Supported by Heriot-Watt University.

### JUNE 2005

**Wednesday 1 June at 6pm**

**DISCUSSION FORUM**

#### **The Ethics of War**

Professor Richard Sorabji CBE FBA, Emeritus Professor of Philosophy, Kings College, London

Professor John Kelsay, Richard L. Rubenstein Professor of Religion and Department Chair, Florida State University

### MAY 2005

**Monday 9 May at 5.30pm**

**GUNNING VICTORIA JUBILEE PRIZE LECTURE**

#### **Energy - A Challenge for Materials Chemistry**

Professor Peter G Bruce FRSE, Professor of Chemistry, University of St Andrews

Whether driven by global warming, the finite nature of fossil fuels or pollution in our cities, there is no doubting the importance of developing technologies for clean energy storage and conversion. This is one of the greatest challenges for humanity in the 21st Century.

Materials chemistry has a key role to play in this endeavour. New materials, with new properties or combinations of properties, including new solid oxides, new nanomaterials, nanotubes, nanowires and new polymeric solids will be discussed, as will their role in enabling the development of a new generation of rechargeable lithium batteries for applications such as static energy storage and hybrid vehicles.



**Friday 20 May at 2pm, The Rowett Research Institute, Aberdeen**

**SABRI JOINT LECTURE**

#### **New Concept of Food Quality: Beyond Safety and Sensory Properties**

Professor Ricardo Uauy, Professor of Public Health Nutrition, London School of Hygiene and Tropical Medicine

Traditional definitions of food quality include safety for human consumption, sensory properties (visual aspect, taste, smell) and the nutritive value in terms of providing essential nutrients. Present epidemiological profiles for most countries indicate that these criteria are clearly insufficient in addressing the epidemic of nutrition-related chronic diseases (obesity, diabetes, cardiovascular disease and diet related cancers). Thus a new definition of food quality that includes the concept of dietary patterns and key nutrients to promote health at all stages of the life course is needed. Tickets for this lecture are available from Dr Sue Bird, RRI. [s.bird@rowett.ac.uk](mailto:s.bird@rowett.ac.uk) Tel : 01224 716668

*Professor Sorabji:* Regime change substitutes one power for another and this does not necessarily benefit the regime's subjects. If change were truly for their benefit, it would be a massive, altruistic and expensive job of protection and nation building, such as is currently proving so difficult in Kosovo. In Iraq, no such attempt was ever intended.

*Professor Kelsay:* Do the benefits of regime change outweigh the burdens? Whilst critics of current policy argue that the US and its allies lack the authority to carry it out, classical Muslim authorities conditionally supported it. Although contemporary Muslim discussion concurs to an extent, there are significant differences - not least where the helping hand of a non-Islamic state is involved.

**Monday 13 June at 5.30pm**

**\*\*LECTURE**

### **How Safe are Vaccinations?**

Professor Harry Burns, Director of Public Health, Greater Glasgow NHS Board

In 1796, Edward Jenner described his success in preventing smallpox by the inoculation of live infectious material taken from people infected with cowpox. Since then, the process of immunisation has been the subject of episodic controversy. Although acknowledged to be one of the most beneficial public health interventions ever, and a significant contributor to increased life expectancy during the 20<sup>th</sup> century, some have called into question methods of immunisation. The role of a Public Health Physician is to examine risks, benefits and concerns, and seek to develop a consensus that protects individuals from infectious diseases and aim to eradicate these diseases from the population.



## **JULY 2005**

**Monday 11 July at 5.30pm**

**LECTURE**

### **Climate Change: Apocalyptic, Much ado about Nothing or Cause for Concern**

Professor John Mitchell OBE FRS, Chief Scientist, Met Office



Attitudes to human-induced climate change range from believing that future changes will be small and easily manageable by technology to fears that we have only a few years to act to save the planet. This lecture will include a description of the science behind human-induced climate change and indicate what is well founded and where the main uncertainties lie, in an attempt to put the issue into perspective.

**\*\* These Lectures form part of RSE Ordinary Meetings and may be preceded by Society Business, such as new Fellows signing the Roll, etc.**

## **SEPTEMBER 2005**

**Monday 5 September at 5.30pm**

**BP PRIZE LECTURE**

### **Russia's Fallen Heroes: Men's Experiences of Post-Soviet Change**

Dr Rebecca Kay, Department of Central and Eastern European Studies, University of Glasgow

In recent years there has been increasing concern about the apparently overwhelmingly negative impacts of socio-economic change on Russian men. Alarming increases in premature death, widespread alcohol abuse, involvement in violent crime, domestic violence and abandonment of the family have all been interpreted as evidence of men's inability to adapt positively to the demands of post-Soviet society. Based on ethnographic research conducted with men in provincial areas of Russia, this lecture paints a rather different picture of men's lives and the many examples of everyday 'heroism' which this project revealed.

## **AUGUST 2005**

**Friday 5 August at 6pm**

**DISCUSSION FORUM**

### **Artificial Intelligence: In your Life Today**

Professor Aaron Sloman, Professor of Artificial Intelligence and Cognitive Science, The University of Birmingham.  
Professor Wolfgang Wahlster, Director and CEO of the German Research Centre for Artificial Intelligence DFKI, Saarbruecken, Germany and Professor of Computer Science at Saarland University, Germany

Science fiction books and recent movies focus on intelligent robots, but Artificial Intelligence covers a much broader scope: we study human and artificial minds, aiming to produce intelligent computing systems which have a direct, beneficial impact on the lives of countless people. How do we build systems which can undertake intelligent activities? Where are these systems, and how can they change lives for the better?

**Monday 19 September at 5.30pm**

**\*\*LECTURE**

### **The Lisbon Earthquake: 250 Years On and Counting**

Presidential Address by Lord Sutherland of Houndwood, KT, FBA, PRSE

On 1 November 1755, Lisbon was devastated by a major earthquake. The damage to life, limb and property was massive and immediate. Thirty thousand people died. The damage to Europe's dominant philosophical and theological foundations was less immediately dramatic, but in the long term was deeply corrosive. Intellectual tectonic plates began to move and now a quarter of a millennium later we are still experiencing the after-shock. Or at least some of us are.

# Young People

Free, fully-organised educational activities for young people throughout Scotland

## Discussion Forum - Summer 2005

**S5 and S6 students to debate topical issues of importance to Scotland.**



To be held during June at the University of St Andrews, on **Climate Change**

Sir David King, UK Chief Scientific advisor feels strongly that Climate Change is the single most important global issue and says :

*This is a global problem requiring a global solution. Climate change is no respecter of boundaries, and the ideas and solutions for meeting challenges thrown up by climate change will not emerge from any single country, however well resourced. Only by acting together can countries tackle the problem. However, we can all help to make a difference. If we reduce the amount of energy we use and make our energy consumption more efficient, we will reduce the impact that we, as individuals, have on the environment. All of us can make a difference by using energy more efficiently and at the same time save ourselves money on our fuel bills.*

Please see the Schools and Young People pages of the RSE website ([www.royalsoced.org.uk](http://www.royalsoced.org.uk)) for the full statement from Sir David King.

Young People from schools in Fife will attend the Discussion Forum in June at the University of St Andrews to hear from experts on the likely causes of Climate Change, possible consequences and proposed solutions. The students will then discuss in workshop groups and tackle specific questions in greater depth. Each group will then present their ideas to the rest of the forum and the event will end with a debate of the points raised. The views and conclusions of the young people will be summarised into a report which will be sent to various decision making bodies, including Scottish and UK governments.

In order to allow other students from all over Scotland to take part in this debate, the RSE plans to make resources available on its web site and also in CD format. This resource pack will include speakers' summaries and guidance on how to run workshops and facilitate the debate. This will allow students in classrooms from the Borders to the Northern Isles to take part in a National Young People's debate on Climate Change. Schools will then send a summary of their proposals for display on the RSE web site and in a further summary report to be circulated to decision-makers.



Students design aircraft at a Startup Science Masterclass at the University of Glasgow.

## Maths masterclasses

### Aberdeen City Council

23 April	Archimedes and his Parrot
7 May	The Triangle, the Rose and the Eleven Times Table
21 May	Messages, Morse and Mathematical Codes
4 June	Happy Numbers, Perfect Numbers and Winning Squares

## Startup Science masterclasses

Five sets of classes are running over the Spring/Summer including a new set at the University of Aberdeen. In addition to those shown below, classes will also be held at Glasgow and Heriot-Watt Universities.

### University of Aberdeen

26 February	Wonderful Water
5 March	Flavours and Fragrances
12 March	Fossils: The History of Life
19 March	Fish that Glow in the Dark

### University of Dundee

7 May	The Good, the Bad and the Deadly – an exploration of the microbial world
14 May	Slug Races and Fruit Feasts
21 May	Skeleton Keys – unlocking the mystery of bones
4 June	Catch the Polluter – a chemical detective story

### University of St Andrews

23 April	Bagpipes and Electrons
30 April	Chemical Cluedo: a murder mystery
7 May	CSI - St Andrews: DNA fingerprinting
14 May	It's a Wonderful Life: fossils and their stories

## Roadshow

8 - 9 March, Dingwall.

Activities for secondary and primary students, in the Dingwall Academy Cluster Group, and for the public, with presenters from the Universities of Edinburgh and Glasgow, and the British Geological Survey (BGS).

**Computer Science Inside....The Mobile Phone** by Dr Quintin Cutts, The University of Glasgow.

Workshops for S4 and Higher Students at Dingwall Academy which explored the role of Computer Science in objects from everyday life – how does your mobile really work? The workshop tried to clarify the role of Computer Science in society, as separate from Information Technology and aimed to motivate an enthusiasm for the subject and highlight the potential for future careers in the area.

**Do I Eat DNA?** by the University of Edinburgh

Workshops for P6/7 students at various primary schools in the Dingwall Academy Cluster group

DNA is all around us and can be found in surprising places. The workshop started with a game, where the children sorted objects according to whether they thought the objects contained DNA or not. They then selected a piece of fruit from which to extract the DNA.



Primary pupils extracting DNA from fruit at the recent Roadshow in Dingwall

**Earthquakes: at home and abroad by Ms Alice Walker, British Geological Survey**

Tuesday 8 March. Dingwall Academy. Lectures for S1 and S4 students, as well as an evening public lecture.

Earthquakes occur everywhere in the world, although most are along the edges of the great plates that make up the Earth's outer skin and which move at about the speed our fingernails grow. Each year, the globe is shaken by thousands of earthquakes, but many go unnoticed except by the seismologists who study them. Large earthquakes can cause landslides and tsunamis and can rupture gas or water mains, causing raging fires and flooding. The UK is not immune from earthquakes - it has around 200 each year! The largest onshore earthquake in the last 140 years occurred in North Wales in 1984. It was felt over much of the UK, and caused damage as far away as Liverpool, 120 km from its epicentre.

Our biggest earthquake in Scotland was smaller and was centred in Argyle, near Loch Awe, in 1880. Scottish earthquakes are still continuing; most recently a small one in June 2003 near Aberfoyle.

Alice Walker has worked extensively for the British Geological Society, focusing on the monitoring and interpretation of earthquakes in the UK. On sabbatical from the BGS, she is currently engaged in a European Space Agency project to promote the use of satellite radars in monitoring millimetric ground movements for improved hazard assessment. She has been a regular broadcaster on TV and radio, bringing information and expertise on UK and worldwide earthquakes to the public.

## Talk Science

- 7 March *Black Holes and White Rabbits* by Professor John Brown at Dornoch Academy
- 15 & 16 March *One Small Step, Many Giant Myths* by Dr Martin Hendry at Wick High School and Thurso High School, as part of National Science Week, 2005.

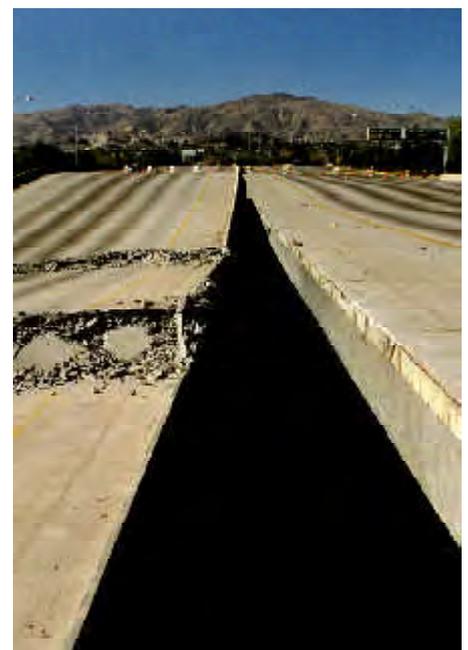


Image courtesy of the Federal Emergency Management Agency (FEMA).

# Fellows' Notice Board

## FELLOWS DECEASED

It is with much regret that we record the deaths of the following Fellows :

Dr Richard Alan BEATTY

Professor Sune BERGSTROM

Professor Peter Stephen FARAGO

Professor John Robert Stanley FINCHAM

Professor Autar Singh PAINTAL

Lord (Henry Alexander Hepburne-Scott) POLWARTH

Sir Edward (Maitland) WRIGHT

Fellows are asked to contact the Fellowship Office, if they could be of help in providing obituary material.

## NEW YEAR HONOURS LIST

### Order of the British Empire Commander (CBE)

Susan Rice

Cheryll Tickle

Donald Ritchie

### Officer (OBE)

Dorothy Crawford

Tom Devine

Anna Dominczak

Roger Mercer

## APPOINTMENTS, AWARDS, CITATIONS

**Sir Philip Cohen**, University of Dundee has been awarded the Molecular Medicine Award of the University of Debrecen, Hungary.

**Frank Gunstone**. In September 2004 Frank Gunstone delivered the Bek-Nielsen Lecture in Kuala Lumpur and was made an Honorary Fellow of the Malaysian Oil Science and Technology Association. In February 2005, he delivered a lecture entitled "Supply and Demand and Hymn Sheets" in Chicago, and was awarded the Alton E. Bailey Award of the American Oil Chemists' Society, for his work as "Author, Mentor, Leader, and Outstanding Researcher in Fats, Oils and Lipids".

## RSE TREASURER'S VIEW

Edward Cunningham, CBE, FRSE was elected Treasurer at the ASM on October 25 2004. Here he sets out how he sees his contribution towards the further development of the Society's aspirations.

"Over recent years, the Society has secured a significant reputation for managing programmes for both private and public sector organisations, such as Lloyds TSB Foundation for Scotland, BP, the Gannochy Trust, Scottish Enterprise and the Scottish Executive. In each case, the Society has been able to offer the unique resource of the expertise and experience of our multidisciplinary Fellowship, and our professional staff. There is considerable scope for building further on the success so far, but this will require effort in making more widely known the Society's capabilities as well as its interests and objectives. Most excitingly, the scope for expansion could be enhanced through the generation of new and innovative proposals. These efforts will require some front end funding, in addition to which they will carry a degree of financial risk. I see my role as facilitating these initiatives at the same time as developing ways in which the risks are kept within manageable limits.

Alongside these programmes, the Society undertakes a number of other activities in seeking to fulfil its role at Scotland's national academy, such as the Communication of Knowledge, our programmes for Events, Youth, and International Relations. The financing of these is more problematic because the Society's own funds are really modest and inadequate to support all that the Society should be seeking to do. It is to support the further development of these activities that I will be working with others to maximise what we can obtain through sponsorship of particular activities as well as to undertake fund raising initiatives directed towards individuals and organisations who share the Society's aspirations.

In the jargon of today, the Society has everything to play for provided that the necessary financial resources can be generated. That will be my specific challenge."

**Edward Cunningham, March 2005**

## E-BULLETIN

The regular Fellows' e-bulletin started in January. Please let us know if you have not received a copy of this, or if you have any comments to make on the bulletin, by e-mailing [bulletin@royalsoced.org.uk](mailto:bulletin@royalsoced.org.uk)

## NOMINATIONS FOR RSE FELLOWSHIP

Fellows are reminded that the closing date for the nomination of new Fellows is 31 May 2005. Nomination forms and supporting documents can be obtained from the Fellowship Office ([fellowship@royalsoced.org.uk](mailto:fellowship@royalsoced.org.uk)) ; Tel 0131 240 5012) or can be downloaded from the "Fellows-only" area of the RSE web site. The password and username for this area are available from the Fellowship Office. Please supply completed nomination forms in electronic format wherever possible.

## ROOMS CLOSED

The RSE Offices will be closed for Easter from Friday 25 to Monday 28 March 2005.

## POSITION PAPERS

The RSE is piloting the production of succinct and informative Position Papers that summarise existing RSE consultation responses on matters of national and international importance. Reflecting a diversity of the expert views of subject specialists within the Fellowship, these papers are being updated over time. The first paper, on *Climate Change* was issued in February. This is available on the RSE Website, or can be obtained from the Research Officer, Dr Marc Rands (evidence\_advice@royalsoced.org.uk).

## FELLOWS' GOLF CHALLENGE

This year the Fellows' Golf Challenge will be held at Crail Golf Club (Balcomie Links), on Monday 22 August. The cost will be around £50 and will include coffee and rolls on arrival, followed by 18 holes of golf and an early evening meal. Please register your interest with Lesley Campbell at golf@royalsoced.org.uk

## STAFF NEWS

Sarah Gilmore, who had been with us as Events Assistant since 2002, left the staff in early January to take up a post with the Leith Agency.

She has been replaced, on a temporary basis, by Susan Rutherford, who is providing administrative support to the events team.

Michael White's secondment from the British Council ends this summer. The post of International Relations Manager has been advertised in the press and interviews will be held during April.

## CHARITIES AND TRUSTEE INVESTMENT (SCOTLAND) BILL

The Society is closely monitoring the progress of the Charities and Trustee Investment (Scotland) Bill, which has now reached Stage 2 of its parliamentary passage and is expected to become law this summer. The Bill contains a raft of provisions affecting the future governance of the charitable sector in Scotland, including a need for all existing charities to prove they merit continuing charitable status. As the Bill continues its passage, the Society will be working hard to ensure it is placed to comply with the new laws and, where appropriate, to help shape them. Fellows currently involved in the work of other registered Scottish Charities who have concerns arising from this new Bill are invited to share them with the Chief Executive, Dr William Duncan, who would welcome a range of informed perspectives on this important issue. Please contact him on Tel: 0131 240 5022; or by email wduncan@royalsoced.org.uk

# Research Awards

## ENTREPRENEURS' CLUB

Past and present Enterprise Fellows, commercialising their research with support from the Society and key funding partners, met at the RSE on January 26 to share their experiences.

RSE Fellows with knowledge of spin-out companies, willing to act as guest speakers for future meetings of this new club, or as Mentors to Enterprise Fellows, are invited to contact Anne Fraser Tel: 0131 240 5013; resman@royalsoced.org.uk

## ABS STUDENT OF THE YEAR

Roderick Sutherland of Caledonian Business School, an RSE/SE Enterprise Fellow in Electronics was recently named 'UK Business and Management Student of the Year - 2004' by the Association of Business Schools.

## RESEARCH & ENTERPRISE AWARDS 2005

Applications are invited for the following research and enterprise awards run by the Society. Fellows are encouraged to draw these to the attention of colleagues and to nominate individuals, where appropriate:

**Scottish Enterprise Fellowships** in Optoelectronics, Microelectronics, Electronics, Energy, Life Sciences, Food & Drink, Forest Industries, Tourism and in convergent areas between these sectors. This scheme aims to provide young researchers with the opportunity to commercialise their research. Fellows must be based in a Scottish Higher Education Institution. Closing date for applications: 1 April 2005

**Lessells Postgraduate Travel Scholarships** in Engineering provide the opportunity to study abroad in an academic or industrial engineering laboratory an aspect of a Scholar's field. Closing date for applications: 31 March 2005

A **BP Research Fellowship** is available in one of the following disciplines: Mechanical Engineering, Chemical Engineering, Control Engineering, Solid State Sciences, Information Technology, Geological Sciences and Chemistry (non-biological). Closing date for applications: 24 March 2005

For details on eligibility, application forms & further information, please visit the RSE Website, [www.royalsoced.org.uk](http://www.royalsoced.org.uk) or contact Anne Fraser/Jenny Liddell; resfells@royalsoced.org.uk Tel: 0131 240 5013

# Avian Flu : What happens next?

On the 1<sup>st</sup> March the UK published its emergency plans for combating an influenza pandemic and announced its intention to stockpile 14.6 million treatment courses of the anti-influenza drug oseltamivir. Meanwhile, international experts continue to track the epidemic of avian influenza ('bird flu') in south-east Asia and express growing concerns about the threat to humans. So what really is the difference between ordinary 'flu' and pandemic 'flu'? How is this linked to 'bird flu'? And what might happen next?

In this article, Sir William Stewart (Chairman of the Health Protection Agency) and his colleague, Dr. Jonathan Van-Tam (Consultant Epidemiologist at the Centre for Infections, London) provide some of the answers...

According to historical records, influenza has troubled mankind for centuries, even though the virus itself was only discovered in 1933. Indeed we are all too familiar with the subject of winter epidemics and outbreaks which occur from time to time and place a large extra burden on health services, sparking winter bed crises. These outbreaks and epidemics also cause extra deaths, mainly in elderly people and this, of course, explains why it is necessary to have an annual campaign of vaccination against the disease. The virus changes slightly from year to year and so the vaccine has to be adjusted to match these changes and re-administered every autumn.

But influenza also has a much more sinister side. In 1918, 1957 and 1968 the virus underwent much larger changes; not the slight changes referred to above, but a complete change in some of the proteins on its outside surface. When this happens a new virus is created which, if it causes illness in humans and can spread easily from person to person, can cause an influenza pandemic (literally a worldwide epidemic). This is exactly what happened in 1918 (Spanish 'flu'), 1957 (Asian 'flu') and 1968 (Hong Kong 'flu'). Because a pandemic virus is so different from its immediate predecessor, very few people have any

natural immunity. This explains the fact that 40 million people worldwide died of 'flu' in the 1918 pandemic, and roughly 1 million in each of the two subsequent pandemics.

No-one can predict when the next pandemic will occur, or how severe it will be, but many experts believe this is now overdue. In spite of modern-day medical care, the effect on public health and society could still be substantial. This explains why national and international preparedness activities are of such great public health importance, and the current level of activity in this area is unprecedented.

The worry is that the 'bird flu' virus (influenza A/H5N1) which caused outbreaks of lethal influenza in chickens in Hong Kong in 1997, and 18 human cases (of whom 6 died), reappeared in south-east Asia in late 2003. Since then it has continued to spread in large outbreaks amongst poultry, and millions of chickens have been slaughtered in an attempt to contain the disease. Of greater concern is the fact that human cases have also continued to occur, with a recent fatality rate of over 70%; since late January 2004, the World Health Organisation has confirmed 59 cases across Vietnam, Thailand and Cambodia, of whom 43 have died.



Sir William Stewart, FRS, PPRSE. Photo by Gary Doak.

So far there is no evidence that the virus has adapted to spread easily from person to person; those affected have all come into close contact with affected poultry and the virus appears only to spread directly from infected birds to man.

However, If person-to-person spread were to occur, the real worry is that it could produce in humans, by recombination of the bird flu virus and the "normal" flu virus, a novel, easily-transmitted, highly virulent virus against which there was no immunity and no vaccine. That is why international authorities are making intensive efforts to control the disease in south-east Asia, and the rest of the world continues its pandemic preparedness in earnest.

Thankfully, unlike in previous pandemics, and for the first time, new anti-influenza drugs are becoming available, but there is as yet no vaccine available, although "prototype" vaccines are being rapidly developed in the UK and the United States. Whether antivirals and an effective vaccine will be available in time in sufficient quantity is an ongoing worry.

---

## COPY DATE

The copy date for the next issue is 30 June 2005. Please send copy to Jennifer Cameron at the Society. newsletter@royalsoced.org.uk

ReSource : ISSN No 1473-7841  
replaces RSE News

## ADDRESS

22-26 GEORGE STREET  
EDINBURGH, SCOTLAND  
EH2 2PQ

Any opinions expressed in this newsletter  
are not necessarily those of  
all RSE Fellows

## INFORMATION

website: [www.royalsoced.org.uk](http://www.royalsoced.org.uk)  
[www.rsescotlandfoundation.org.uk](http://www.rsescotlandfoundation.org.uk)  
e-mail: [rse@royalsoced.org.uk](mailto:rse@royalsoced.org.uk)

Tel: 0131 240 5000

Fax: 0131 240 5024