

**For release immediate release 8/8/08**

## **Media Information**

### **Royal Gold Medals for outstanding achievement**

His Royal Highness The Duke of Edinburgh is to present Royal Medals to three individuals whose achievements have brought about benefits on an international scale. The prestigious awards will be made to Professor Roger Fletcher, The Right Reverend Richard Holloway and Professor Sir David Lane for outstanding contributions to their respective fields and to the wellbeing of others. The Medallists have been approved by the RSE's Patron, Her Majesty The Queen, who presented them for the first time in July 2000. The Medallists are recommended by the RSE's Council, in recognition of intellectual endeavour which has had a profound influence on people's lives, world-wide. The Duke will make the presentations at The Palace of Holyroodhouse on Monday 11 August 2008.

#### **President of The Royal Society of Edinburgh, Sir Michael Atiyah said:**

*His Royal Highness The Duke of Edinburgh honours us by awarding The Royal Medals in person. Professor Fletcher's optimisation methods and software have been used widely in diverse fields, such as space exploration and power generation. Dr Holloway's acclaimed writing and contribution to public debate and the lives of others, set him out as one of Scotland's great thinkers. The p53 tumour suppressor gene, discovered by Sir David Lane, is the single most important defender of the cell against cancer. They are all worthy recipients of The Royal Medal.*

#### **The Royal Medallists**

##### **Physical and Engineering Sciences**

**Professor Roger Fletcher FRS FRSE**, has made an outstanding contribution to mathematics and software development. One of the world's leading mathematicians, Roger Fletcher is known to practitioners, researchers and undergraduate students across the whole spectrum of science, engineering and business. Based at The University of Dundee, Professor Fletcher is an expert in Optimisation, a field which crosses all subject boundaries (e.g. how to improve drug design; minimise production costs, maximise power output; find the lowest energy configuration) and so Professor Fletcher's work impacts upon the lives of people around the world. The reputation of applied and computational mathematics in Scotland has benefited enormously from the presence of Roger Fletcher, and it is for this outstanding contribution that he is being awarded a Royal Medal.

##### **Humanities and Social Sciences**

**Right Reverend Richard Holloway FRSE**, has made an outstanding contribution to the cultural life of Scotland through his public debates on ethics and theology and by promoting, and direct involvement in, public policy issues. Dr Holloway fulfils the role of public intellectual, while having been engaged throughout his life with the affairs of his church, the under-privileged in the societies in which he has lived and worked, and the literary and cultural life of Scotland. A highly skilled communicator, he is known to an immense range of people from all backgrounds. Richard Holloway is a Scottish Enlightenment figure who serves the needs and debates of the twenty-first century, and it is for this outstanding contribution to Scottish public life that he is being awarded a Royal Medal.

## Life Sciences

**Professor Sir David Lane FRS FRSE**, has made an outstanding contribution to cancer research through his discovery of p53 tumour suppressor gene. This protein is the single most important defender of the cell against cancer. One of the world's foremost scientists, Sir David established the very important biotechnology venture, Cyclacel Pharmaceuticals Ltd in Dundee, which has benefited the local community and is now Chief Scientist for Cancer Research UK, Britain's largest cancer charity. Sir David, who is based at The University of Dundee, has been a tireless ambassador for UK science around the world. Sir David's commitment to developing new treatments, along with the vital part he is playing in developing a knowledge-led economy in Scotland, is evidence of his outstanding contribution to society and the reason he is being awarded a Royal Medal.

### Further Biographical Detail:

**Professor Roger Fletcher FRS FRSE**, has made pioneering and sustained research contributions that have made him one of the elite group of active mathematicians in the world whose name (and work) is familiar to practitioners, researchers and even undergraduate students across the whole spectrum of science, engineering and business.

Professor Fletcher has made fundamental contributions to the hugely important area of optimisation (also called mathematical programming). Optimisation problems are ubiquitous in science, engineering and beyond, for example, how to schedule airline crew, how to improve a drug design, how to minimize production costs, how to maximize power output, how to find the lowest energy configuration, and how to find the best combination of medicines for a particular patient.

He has set a rigorous tone and a demanding pace in numerical optimisation, combining theoretical analysis, original algorithms, software development, and insight into practical applications. Professor Fletcher is a world-renowned figure in numerical analysis, applied mathematics and operational research.

He made groundbreaking inroads in the very early days of algorithm design and his name is associated with three classic methods: Davidon-Fletcher-Powell, Fletcher-Reeves and Broyden-Fletcher-Goldfarb-Shanno (BFGS). These algorithms bring large-scale optimization problems within the reach of computers. They are of such fundamental importance that they are presented as primary tools to undergraduates in areas that spread far wider than the physical sciences, covering subjects as diverse as engineering, economics, bioinformatics and indeed any activity that involve quantitative study.

Professor Fletcher was made a Fellow of the Royal Society of Edinburgh in 1988 and of the Royal Society of London in 2003. He was honoured twice by the Society of Industrial and Applied Mathematics (SIAM) and Math Programming Society, the premier international award made every three years based on the mathematical quality, significance, and originality of one or more publications. He achieved the highest distinction in his research area when he was awarded the 1997 George B Dantzig Prize from the Society of Industrial and Applied Mathematics.

The reputation of applied and computational mathematics in Scotland has benefited enormously from the presence of Roger Fletcher, and it is for this outstanding contribution that he is being awarded a Royal Medal.

**Right Reverend Richard Holloway FRSE**, has kept before the public, both in Scotland and across the world, central issues of ethics, theology and culture, and by a combination of erudition, scholarly acumen, searing honesty and the skills of a supreme communicator has challenged established positions within, and far beyond, the ecclesiastical community from which he has emerged.

Dr Holloway's place in the society of modern Scotland is unique, in that he fulfils the role of public intellectual, found more commonly among academics, while having been engaged throughout his life with the affairs of his church, the under-privileged in the societies in which he has lived and worked, and the literary and cultural life of Scotland. He is known to an immense range of people of all types and from all backgrounds.

He has been of particular and outstanding significance in public debates on matters of ethics and theology, in promoting and being directly involved in public policy issues, for example, housing and poverty, and in challenging the Christian churches with a sceptical but actively supportive presence. He has been, and remains, a person who not only thinks and expresses himself admirably clearly on major issues of our day but who also enable others to think about them.

Dr Holloway's public service can be seen in his active role as Chair of a diverse range of organisations, for example, the Christian Action housing Association in Glasgow, the Castle Rock Housing Association in Edinburgh, bfriends (Royal Scottish Society for the Prevention of Cruelty to Children), Refugee Survival Trust, Edinburgh Voluntary Organisations Council, Chair of Judges Creative Scotland Awards and the Scottish Arts Council, to name but a few.

Richard Holloway was one of the original members of the Human Fertilisation and Embryology Authority, established by the Human Fertilisation and Embryology Act (1990). He showed profound understanding of the moral issues involved in research using human embryos, the issue that lay at the heart of the work of the Authority. His modest, reasonable, compassionate approach was one of the factors that gave the Authority the trust and respect without which its work would have been impossible, and which makes its regulatory and overseeing function the envy of other countries. It is Dr Holloway's combination of respect for science and compassion that most characterises his work.

Richard Holloway is commended as a Scottish Enlightenment Figure who serves the needs and debates of the twenty-first century. It is for his outstanding contribution to the cultural life of Scotland through his public debates on ethics and theology and by promoting, and direct involvement in, public policy issues that he is being awarded a Royal Medal.

**Sir David Lane FRS FRSE**, is one of the world's foremost scientists who has made seminal discoveries in cancer research and made major contributions to science in the UK and particularly in Scotland.

Sir David discovered the tumour suppressor p53. This protein is the single most important defender of the cell against cancer and is a crucial mediator in the cell cycle in processes varying from cancer to senescence. p53 patrols the cell, hunting for stresses that may lead to the cell becoming cancerous. It then either attempts to repair damage in DNA or, failing that, causes programmed cell death. Understanding p53 is essential in understanding the cell cycle, and p53 is a crucial target in cancer therapy.

Sir David has capitalized on his discoveries by setting up Cyclacel Pharmaceuticals Ltd in Dundee which has benefited the local community as well as being a very important biotechnology venture.

He has been a tireless ambassador for UK science, not only in regular conferences, but also his work in Singapore, as the Executive Director of the Institute of Molecular and Cell Biology. His scientific brilliance is accompanied by personal charm and support of fellow scientists.

In the New Year honours list of January 2000 David Lane was knighted for his contribution to cancer research. He is a Fellow of the Royal Society of London and the Royal Society of Edinburgh. He is also a Fellow of the Royal college of Pathologists, the Royal College of Surgeons (Edinburgh) and a founder member of the Academy of Medical Science. For his business acumen he was awarded Emerging Entrepreneur of the Year. He is dedicated to the successful translation of research for patient benefit and participated in the early discussions around the scientific benefits of the merger of ICRF and CRC to form Cancer Research UK.

Sir David Lane's work has had a major impact on cancer research. He is now Chief Scientist for CRUK, the UK's largest cancer charity. His research today is as fresh, innovative and important in cancer biology as at any time over his remarkable thirty year career. His commitment to developing new treatments, along with the vital part he is playing in developing a knowledge-led economy in Scotland, are evidence of his outstanding contribution to society and the reason he is being awarded a Royal Medal.

#### **Previous Royal Medallists:**

The Royal Medals were presented for the first time in July 2000, when Her Majesty The Queen awarded them, in person, at The Royal Society of Edinburgh to:

- Professor Sir Kenneth Murray, FRS, FRSE for his groundbreaking work in developing a vaccine for Hepatitis B, improving healthcare world-wide.
- Professor Peter Higgs, FRS, FRSE for offering a key to the problem of the origin of Mass. The Higgs boson has been a crucial step towards a unified theory of the forces of Nature.
- The Rt Hon The Lord Perry of Walton, OBE, FRS, FRSE for his outstanding career in science and education, and for his pioneering work in developing the Open University, which has been a model for similar institutions around the world. Lord Perry died in 2003.

In 2001 HRH The Duke of Edinburgh presented Royal Medals in The Palace of Holyroodhouse to:

- Professor Sir James Black, OM, FRS, Hon FRSE, for his discovery & development of two blockbuster drugs: the renowned “ $\beta$ -blocker” drugs, notably propranolol, which changed cardiovascular therapeutics beyond recognition and cimetidine, which profoundly improved the therapy of the peptic ulcer with cimetidine.
- Professor Tom Devine, FRSE, HonMRIA, FBA for his distinguished and highly acclaimed work on Irish and Scottish economic and social history which impacted upon the “peace process”.
- Professor Ian Scott, FRS, FRSE for his revolutionary work on the way in which vitamin B12, the essential life pigments chlorophyll and heme, and the important anti-tumour agent taxol, are produced. Professor Scott died in 2007.

In 2002 HRH The Princess Royal presented Royal Medals at a Jubilee Dinner ceremony held in the Signet Library to:

- Professor Sir Alfred Cuschieri FRSE, for his outstanding contribution to the practice of medicine and pioneering developments in minimal access or ‘keyhole’ surgery.
- Professor John R Mallard OBE, FRSE, for his outstanding, pioneering work in the field of medical imaging and diagnosis; developing two of the most important diagnostic technologies of the 20th century, namely Nuclear Medicine and Nuclear Magnetic Resonance Imaging (NMRI).
- Professor Sir Alan Peacock DSC, FBA, FRSE, for his outstanding contribution to Social Science and Public Policy; having achieved international distinction on a range of fiscal issues where he has enhanced our understanding of key problems in both taxation and public expenditure.

In 2003 HRH The Duke of Edinburgh presented Royal Medals in The Royal Society of Edinburgh to:

- Sir Michael Atiyah OM, PPRS, HonFRSE, for his profound and beneficial effect on the development of mathematics and science in the UK and Europe.
- Lord Mackay of Clashfern KT, PC, QC, FRSE, for his outstanding contributions to Scots Law and public service, both within the UK and internationally.
- Professor Sir Paul Nurse FRS, HonFRSE, for his outstanding contribution to genetics research, in particular its relevance to cancer, in which he has become a leading figure nationally and internationally.

In 2004 (then) RSE President, Lord Sutherland of Houndwood presented Royal Medals in The Royal Society of Edinburgh to:

- Professor Sir Philip Cohen FRS, FRSE for his outstanding contribution to Life Sciences.
- Professor Sir Neil MacCormick FRSE, FBA, QC for his outstanding contribution to academic life in Scotland and internationally, particularly in the field of legal philosophy.
- Professor Robin Milner FRS, FRSE for his outstanding contributions to software Engineering which have changed the face of modern computer science.

In 2005 (then) RSE President, Lord Sutherland Of Houndwood, presented Royal Medals in The Royal Society of Edinburgh to:

- Professor Sir David Edward KCMG, QC, FRSE for his outstanding contribution to the law both in the European Union and in Scotland, to the legal profession in Scotland, and for his contribution to public life.

- Professor William Hill OBE, FRS, FRSE for his outstanding achievements in the field of Life Sciences.

In 2006 RSE President, Professor Sir Michael Atiyah presented Royal Medals in The Royal Society of Edinburgh to:

- Professor Sir John Ball FRS, FRSE for his outstanding contributions to applied mathematics and his public service to the international mathematics community.
- Sir David Jack CBE, FRS, FRSE for his outstanding contribution to the pharmaceutical industry and his untiring work and contributions to scientific organisations concerned with drug design and development.

In 2007 HRH The Duke of Edinburgh presented Royal Medals in Edinburgh's Telford College to:

- Professor Sir David Carter, FRCSE, FRCS, FRCPSG, FRCPE, HonFACS, HonFRCSI, FRSE for his outstanding contributions to Life Sciences as a Surgeon, a clinical academic and an outspoken leader in the field both nationally and internationally.
- Professor John Laver, CBE, FBA, FRSE for his outstanding contributions to the Humanities and Social Sciences, particularly in the field of phonetics, and his inspired academic leadership.
- Sir Thomas McKillop, FRS, FRSE for his outstanding contributions to business and public service in Scotland and internationally, particularly in the fields of biotechnology and finance.

### **The Making of The Royal Medals**

The distinguished designer and engraver Malcolm Appleby of Grandtully near Aberfeldy has designed and created the Royal Medals. Mr Appleby's work has been exhibited in many of the world's most prestigious museums and galleries. His commissions include engraving work on an orb for His Royal Highness The Prince of Wales' coronet, and pieces for The Royal Armouries, The Victoria & Albert Museum, and National Museums of Scotland. As the Royal Medals recognise outstanding achievement in all intellectual fields, it was decided to unify them by commissioning one design for all three medals.

### **About the RSE**

The Royal Society of Edinburgh (RSE) is an educational charity, registered in Scotland.

Independent and non-party-political, our wide-ranging educational activities include:

- Organising lectures, debates and conferences
- Conducting major independent inquiries
- Providing educational activities for school students throughout Scotland
- Distributing over £2 million to top researchers and entrepreneurs
- Showcasing to the World the best of our research and development
- Increasing two-way international exchanges
- Encouraging, promoting and rewarding excellence
- Offering state-of-the-art conference facilities
- Publishing internationally respected learned journals

The RSE was founded in 1783 by Royal Charter for the "Advancement of Learning and Useful Knowledge". It is regarded as Scotland's National Academy of Science and Letters. Today it has around 1400 Fellows whose expertise encompasses the full spectrum of the sciences, medicine, engineering and technology, education, law, the arts, humanities, social sciences, business, industry, the professions and public service. This multi-disciplinary perspective makes the RSE unique amongst the United Kingdom's learned societies. It is funded by a range of carefully selected charitable, public and private bodies. Its mission today is providing public benefit through the advancement of learning and useful knowledge. The Royal Society of Edinburgh, Scotland's National Academy, is Scottish Charity No.SC000470.

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