

Bush Telegraph

The House Magazine of the Edinburgh Consortium for Rural Research

Farewell from Chris



Chris Browitt

After six most enjoyable years of working with ECRR member organisations and their wider networks, I will be standing down as Scientific Director at the November Board meeting this year. For me, this has been a fruitful period of expanding interests and contacts in new fields through our monthly meetings, annual lectures at the RSE, one-day Forums and occasional seminars, together with the background activities that underpin them. I would like to thank all who have contributed to maintaining our healthy ECRR network through this period; particularly the ECRR Directors, (nominated by the Institutes and Departments), who have been in the frontline of inter-agency communications, with many of them serving for periods on our Executive Committee to guide policies, events and evolution. Of special mention and thanks are: Mary Bownes in her critical role at our interface with Edinburgh University and her chairmanship of ECRR, John Oldham for his

expert leadership in chairing the Executive, Mike Talbot for his indefatigable work as Secretary, Treasurer and designer of this house magazine, and Mike Steele for his efforts as editor.

We have held three significant events this year. In February, our annual **Peter Wilson Lecture** was delivered by Professor John Beddington, UK Chief Scientist. He focused on the difficult issues of a rapidly expanding world population (9 billion by 2050), increased urbanisation, food requirements, energy and water demands, economic migration and human vulnerability. He argued that the solutions to these "Global Challenges in a Changing World" would include behavioural changes (for which incentives are needed) together with investment in science and technology, including in carbon capture and storage, nuclear energy (including fusion) and renewables, and in reducing waste of energy and other resources (eg water, pesticides and fertilizers). We need to find ways to increase food production by 50% in 30 years, improve our climate models and regulate our fertility. This last will be better achieved through educating and empowering women rather than through legislation, as well as making use of new medical tools. In conclusion, the very strong message was that this is the time to increase investment in Science and Technology despite the present financial constraints. A synopsis of his lecture is available on the RSE website.

In May, our very successful **ECRR Biennial Forum** (on Biodiversity) was organised by Martin Price, (UHI, Centre for Mountain Studies), at SNH, Battleby. A summary report of its proceedings is now available on the ECRR website and in hardcopy from Mike Talbot.

IN THIS ISSUE

Flooding misery Minimising flooding risk is the focus of ECRR workshop	Page 2
Merger on the cards SCRI joins with the Macaulay in merger talks	Page 3
Excellence rewarded Scientists at the Roslin Institute are honoured	Page 4
Prevention before cure Novel animal disease vaccines from the Moredun Research Institute	Page 5
Botanists on the front line RBGE helps Iraq and Afghanistan restore their botanical heritage	Page 6
Changes at the top Brian Cross takes over at the Institute of Aquaculture	Page 7
Ex-citing science Scotland's science citation rate is outstanding	Page 8
Oceans alive Conserving our marine resources is a major research focus at St Andrews University.	Page 9

For our **Occasional Seminar/Workshop** series, in September we held an afternoon discussion on "Rural Flooding Issues: Challenges and Opportunities" at BGS Murchison House.

As mentioned last year, your new Scientific Director is Professor Stuart Monro who will take up the office as he steps down as the independent co-chair of the Scottish Science Advisory Council. We anticipate that Stuart will bring to ECRR a whole raft of experiences and contacts from this previous position and from his continuing work as Director of Science at Our Dynamic Earth. My best wishes, support and hopes of good fortune go with him.

Chris Browitt

ECRR Scientific Director
October 2009

Water, Water Everywhere



Allan Water in flood in 2005

It is not often that the importance of a workshop is so dramatically highlighted by contemporaneous natural events. On 3rd September 2009 an ECRR-sponsored workshop on rural flooding was held at the British Geological Survey, Edinburgh. That day, and the following day, torrential rain caused widespread flooding across Scotland.

The workshop "Rural Flooding Issues: Challenges & Opportunities" was organised jointly with the expert assistance of Professor Chris Spray (Dundee University). Four speakers introduced the topic and covered the hydrology/hydrogeology science base, Forestry options for land management, and new regulations and policies for flood risk management.

Opening the workshop, **Chris Spray, UNESCO Centre, Dundee University** observed that rural flooding is natural but creates big problems to communities, who suffer breakdowns in communications and transport as well as the physical impacts to property, land management and the triggering of landslides. Their fear of future floods is also an important issue, with climate change increasing both these perceptions and reality.

Our manipulation of the landscape and vegetation has already increased river flows with peaks having risen by up to 60% in the past 40 years.

Alan MacDonald, British Geological Survey, emphasised the importance of understanding water catchments from a scientific perspective before examining whether natural or artificial barriers might help. He cited examples where artificial barriers to solve one problem blocked pathways that had previously alleviated the flood risk. There are still science questions to be answered in these fields. For example, does the large water storage capacity of peat help or hinder, are land drains, which channel water more quickly down slopes, a problem or does their drying impact on the soil create a beneficial absorption sink? Ground water flooding is also an issue, where full rivers can push ground water to the surface much further away; this hydrogeological regime needs to be better understood. The differing chemistry of groundwater is a help in understanding its sources and pathways. He concluded that both surface and groundwater form a continuum, so it is essential for hydrologist and hydrogeologists to work together in finding solutions.

Nadeem Shah (Forest Research) outlined how trees, which are the natural rural vegetation, can limit flooding impacts. However, we have lost 90% of floodplain forests in Europe. He advocated that tree cover needs to be viewed in a holistic way; trees can delay the flood peak and reduce its size depending on their "hydraulic roughness", debris dams formed by uncleared forest litter can help, and sediment retention is beneficial. Of course, trees also add the benefits of pollutant interception, biodiversity and carbon storage. Artificial debris dams, as "soft engineering", have been shown to be beneficial at the experimental scale.

Finally, **Roy Richardson, (Scottish Environment Protection Agency)** who has responsibility for the new "Flood Risk Management (Scotland) Act 2009", outlined the benefits of this legislation over the 1961 Act which it replaces. It emphasises the role of the Local Authority as the principal body for protecting the public but requires coordination to ensure that the whole catchment can be better managed; in some cases, increasing risks in some areas to achieve much greater benefits elsewhere. There is also a requirement to link various planning processes to gain overall multiple benefits. In support of this holistic approach, a national flood management research strategy is being developed (SNIFFER project FRM15) with a consortium of institutions led by Dundee University. The research will include physical processes, implementation (land management, community context), and wider benefits (biodiversity, water quality, environment, and socio-economics).

During the subsequent lively discussion, Chris Browitt presented a new space radar monitoring technique which can see ground subsidence at rates of only one millimetre per year. It has the capability of mapping those areas of the built environment which are subsiding and, therefore, which, over many years, will become at greater risk in the face of future flooding.

Scottish Crop Research Institute



Lorraine Wakefield

Information & Online Service Officer
SCRI, Invergowrie, Dundee DD2 5DA
Email: lorraine.wakefield@scri.ac.uk

SCRI & MACAULAY TO MERGE

SCRI and the Macaulay Land Use Research Institute have agreed in principle to unite, strengthening Scotland's rural-environmental research capacity and further enhancing their international competitiveness. Together they will form a new powerhouse for research into food, land use and climate change.

It will be the first institute of its kind in Europe and the new organisation is expected to create an international office to reinforce its global presence. SCRI and the Macaulay already have extensive global links: SCRI has international development links to Africa and trade links to China and the Macaulay is active in more than 40 countries worldwide.

Both have international reputations for the quality of their scientific research:

- SCRI's genetics team was described earlier this year as "the world leader in barley and soft fruit genetics" by independent experts.
- The Macaulay competitively won over £5 million in new research contracts last year, including £1.8 million from the European Commission.

UNEARTHING THE FAMINE STORY

Scientists at SCRI have helped decode the genome of the notorious pathogen that caused the Irish potato famine in the mid-19th century and still costs the world £3 billion a year.

The team at SCRI, led by Dr Stephen Whisson, SCRI Plant Pathology programme and Professor Paul Birch, University of Dundee Division of Plant Sciences at SCRI, were part of a large international research team. The study is published in the September 9 online issue of the prestigious journal *Nature*.



The Irish potato famine in the mid 1800s was caused by the pathogen *Phytophthora infestans*. Long considered a fungus, it is now known to be a member of the oomycetes or "water moulds", which are more closely related to brown algae than to fungi.

The findings suggest an unusual genomic strategy to support the rapid evolution of critical genes, known as "effector" genes. Effector genes can disrupt plants' normal physiology, enabling the pathogen to establish a foothold. However, some can also trigger plants' immune responses, making them prime targets for combating *P. infestans* infection. Importantly, the new *P. infestans* genome sequence enabled the researchers to identify many previously unknown effector genes.

WORKING WITH M&S

Marks & Spencer has launched an initiative to help farmers become more environmentally sustainable. M&S is working with a number of experts, including from SCRI, to develop a set of practical measurements that will allow farmers to assess how they currently work, make improvements and monitor progress such as measuring water and fertiliser usage.

UK FOOD CONSULTATION

The Westminster government has suggested a "radical rethink" is required of how the UK produces and consumes its food. Producers, supermarkets and consumers are being invited to suggest how a secure food system should look in 2030.

SCRI's Director and Chief Executive, Professor Peter Gregory, welcomed the consultation. He said: "Globally, suitable land for arable agriculture is limited and, as over the last 60 years, increases in production will need to come from increased yields. The challenge for SCRI is to find new crop varieties and new systems of crop production that can do this while simultaneously using inputs more efficiently and reducing emissions to the atmosphere and water bodies."

An independent economic impact assessment of SCRI estimated the organisation generated £160 million of business every year in the farming, manufacturing and retail sectors in Scotland and the rest of the UK.

The Roslin Institute, University of Edinburgh



Patricia Hart

Communications Officer

The Roslin Institute, University of Edinburgh

Roslin, Midlothian EH25 9PS

Email: patricia.hart@roslin.ed.ac.uk

EBRC CELEBRATES FIRST BIRTHDAY

At the end of April, colleagues from the Easter Bush Research Consortium (EBRC) met at the Moredun Research Institute to celebrate the organisation's first birthday with a series of presentations from collaborators. Work on the Institute's new building at new Easter Bush location is well under way. Once complete (due 2011) the move will bring all the EBRC partner organisations into the same geographical location with immediate collaborative opportunities.

Professor Julie Fitzpatrick, Moredun's Chief Executive Officer, in her introduction to the anniversary celebration spoke about the Scottish Partnership for Animal Science Excellence (SPASE) which will form an alliance that includes partners from the Universities of Aberdeen, St. Andrews, Stirling and Glasgow.

Next year is going to be another busy one as the EBRC partners start to work with their SPASE partners. A recent Scottish Enterprise commissioned report highlighted the growing recognition that Scotland is leading the world in Animal Sciences, despite the current economic downturn. The UK government's focus on food safety is a definite target for the EBRC and SPASE.

Scotland continues to be a major player in the world science community. Publications in biology and biochemistry from Scottish research rank third after the USA and Switzerland in terms of citation per paper. Over 8.0% of Scottish jobs are in the Science and Technology sector and EBRC's researchers play a major role in the Scottish Animal Sciences field especially through collaboration with other science and industry partners.

RECOGNISING EXCELLENCE

Professor Steve Bishop of The Roslin Institute has won the 2009 BSAS Sir John Hammond Prize. This is in recognition of his extensive contribution to research in animal science especially his novel work on the genetics of host variation in resistance to parasites and disease. This work has had a major influence world wide on how animal scientists and farmers approach breeding for nematode and infective disease resistance.

Professor David Hume (Director of The Roslin Institute) and Professor Jean Manson (Head of the Institute's Neuropathogenesis Division) have been elected as fellows of the Royal Society of Edinburgh (RSE).

ROSLIN AT THE SHOW

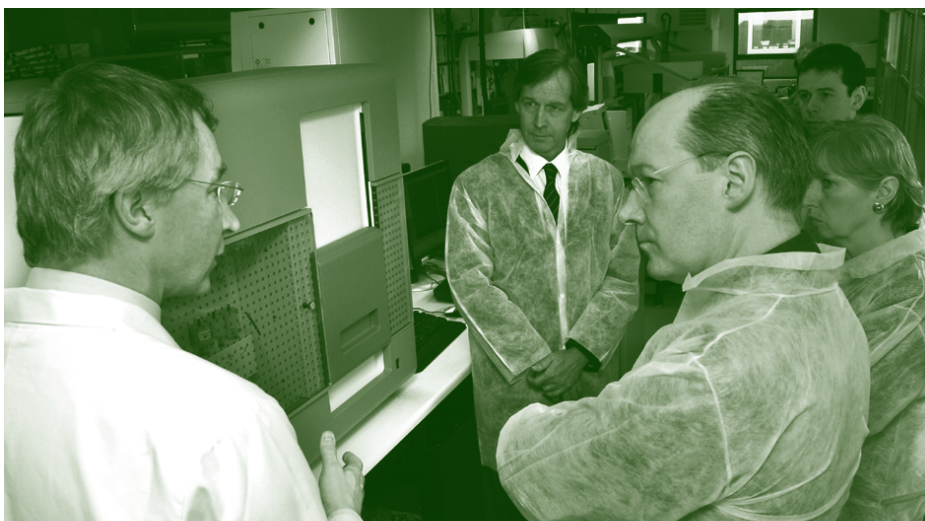
This year The Institute had a presence at the Royal Highland Show joining forces with colleagues from the Royal (Dick) School of Veterinary Studies to create a stand that attracted children, farmers, scientists, future vets and many other members of the general public. A real hit with family and school groups was a quiz designed to highlight the differences between breeds of cattle and sheep and how farmers have developed the breeds to optimise the production of meat, milk & wool.

VISITORS

The Roslin Institute recently welcomed the Scottish Government's Finance Minister, Mr John Swinney MSP. Prof Hume said, "It was a pleasure to welcome Mr Swinney to The Roslin Institute and we had what I hope will turn out to be a very productive discussion about the possibilities to put Scottish Animal Sciences at the forefront of the world stage."

Also attending were Professor Anne Glover, the Chief Scientific Advisor for Scotland, representatives from Scottish Enterprise, Sir Tim O'Shea (University of Edinburgh Principal) and Sir John Savill (Head of the College of Medicine and Veterinary Medicine).

Ann McKechnie MP, Parliamentary Under Secretary of State at The Scotland Office also recently visited The Roslin Institute to hear more about how its research fits into the wider Life Sciences field. Barry Shafe of Edinburgh Science Triangle attended along with representatives of Midlothian Council and together with David Hume, discussed Scotland's profile in the Animal Sciences sector.



MSPs John Swinney and Rhona Brankin on their visit to the Roslin Institute

Moredun Research Institute



Margaret Bennett

Moredun Research Institute

Pentlands Science Park,

Penicuik, Midlothian

Email: margaret.bennett@moredun.org.uk

JOINING FORCES

The Moredun Research Institute is likely to become an "affiliate" of the new 'super-institute' being formed in a merger of the Scottish Crop Research Institute and the Macaulay Land Use Research Institute.

Professor Julie Fitzpatrick, Director of the Moredun, and the Chairman, John Jeffrey, said they were pleased to announce their support of the formation of the new institute which is likely to come into being in 2011. The news was announced at a briefing for the media held at the Scottish Parliament and hosted by the Environment Minister, Roseanna Cunningham MSP and her Chief Scientific Adviser, Professor Maggie Gill.

It is expected that there will be increased collaborations in the areas of livestock/wildlife interactions; livestock/environmental interactions; delivery systems for novel vaccines and technology platforms in genomics, proteomics and bioinformatics, to name but a few.

A panel of scientists from MRI and from the new institute will meet to prioritise and plan project proposals and delivery.

Staff of the new institute will also get access to facilities in Edinburgh, Dundee, and Aberdeen so that staff travelling to any of these cities may have a "home office" where they can be based during their visits.

The new institute and MRI are also expected to establish an "international office" to jointly exploit opportunities and to enhance knowledge exchange activities.

WORK SHADOWING INITIATIVE

The Minister for Environment, Roseanna Cunningham recently praised a Moredun led project aimed at fostering closer links between working scientists and policy makers.

A novel work shadowing scheme, which was organised by Moredun Research Institute through the *knowledge scotland initiative*, matched ten scientists from Scotland's leading research institutes to ten policy makers from the Scottish Government. Scientists from Moredun Research Institute, SAC, Scottish Crop Research Institute, Rowett Institute of Nutrition and Health and the Macaulay Land Use Research Institute spent a week at the end of August with representatives from three Directorates of the Scottish Government: Rural; Chief

Medical Officer and Public Health and Rural and Environment Research and Analysis.

Speaking at an informal reception in Edinburgh launching the scheme, The Minister for Environment, Roseanna Cunningham said; "As Minister for Environment I am especially reliant on scientific advice and I need to have confidence that it is impartial, reliable and robust to challenge. This is only possible through the science community sharing their knowledge and findings." She continued, "*The knowledge scotland project* is of special interest to me as it brings people together to lower barriers and improve communication. This work shadowing scheme will give scientists the opportunity to experience at firsthand how the Scottish Government operates."



Minister for Environment, Roseanna Cunningham along with Professor Maggie Gill and participants from the work-shadowing initiative.

SCIENCE INTO ACTION

"Prevention is better than cure" also applies to the animal health industry, where vaccination approaches to disease prevention are much preferable to alternative methods, such as test and cull. Adopting this approach, Moredun Research Institute (MRI) Scientists have developed a new technology for producing vaccines for a range of livestock diseases. The first disease they are focusing their efforts on is, caseous lymphadenitis (CLA), a bacterial infection of small ruminants, including sheep and goats. CLA is a global problem for farmers, leading to production losses through low weight yield and contamination of meat and wool.

The new approach developed by MRI

scientists is expected to result in a more effective vaccine than those currently available globally. In addition, Moredun's new vaccine will be a 'marker' vaccine which means that it will not interfere with the diagnosis of the disease in animals when using the diagnostic test previously developed by MRI. Another advantage of this new marker vaccine is that it will allow farmers and vets to differentiate between animals naturally infected with CLA and those previously vaccinated with the new CLA vaccine.

MRI have now secured funding from Scottish Enterprise, through their Proof of Concept Programme for a 2 year programme with a view to develop a commercial CLA vaccine for both the UK and global market.

Royal Botanic Garden Edinburgh

ROYAL
BOTANIC
GARDEN
EDINBURGH



Sandra Donnelly
Press & Marketing Officer
Royal Botanic Garden Edinburgh
20A Inverleith Row, Edinburgh EH3 5LR
Email: s.donnelly@rbge.org.uk

JOHN HOPE CENTRE OPENS

The John Hope Gateway at the Garden in Edinburgh has opened its doors to the public. The finished building boasts improved visitor facilities for the Garden and a window into the biodiversity of Scotland, showcasing the latest developments in sustainable technology.

The new building, named after John Hope who was RBGE's Regius Keeper from 1761 to 1786, features a Real Life Science Studio, permanent and temporary exhibitions, interactive media, Botanic shop, plant sales and Gateway Restaurant.

The centre, includes a central spiral staircase which winds out of the ground like a twisting tree root, mimicking the double-helix of a DNA strand.

The centre itself, part-powered by a wind-turbine, includes staff rooms, conference rooms and a specially designed schoolroom for visits of local children.

BOTANISTS ON THE FRONTLINE

Tony Miller, the Royal Botanic Garden Edinburgh's expert on the flora of Arabia, is at the forefront of major projects in Iraq and Afghanistan to help the natural world recover from decades of warfare and sanctions.

Tony, who is Director of the Centre for Middle East Plants (CMEP) based at RBGE, and his colleague Dr Sophie Neale are both involved with projects in the two strife-torn countries. Last April they led a 10-day training course in Practical Field Botany in the Kurdistan region of Iraq attended by 12 trainees from institutions such as Nature Iraq and the University of Basrah.

More recently Tony has visited Afghanistan where he is advising on the establishment of a botanic garden at Kabul University. The four-hectare site will provide an important resource for students, particularly those interested in medicinal plants, as well as a Garden for the public to visit.

RBGE has one of the best collections of herbarium specimens and library resources from the Middle East of any scientific institute in the world. Within SW Asia RBGE is regarded as the most important centre of the study of Middle East plants in the world.

Talking about his trips to Iraq, Tony said: "Certainly when one thinks of Iraq, one thinks of bombs, gas and war. However, things are changing in Kurdistan. We felt safe and the people were friendly and welcoming.

"It is difficult to believe we were working in areas devastated by Saddam where he used gas on women and children. We were very close to Halabja where over 5000 people were killed in a gas attack. We surveyed near caves where the Peshmurga-Kurdish freedom fighters held out. We saw villages abandoned when Saddam's soldiers moved the people out. All the time we were told of how Saddam's soldiers had come through the areas cutting down all the trees."

Tony added: "One of the greatest challenges RBGE faces in Iraq is that botany has been at a standstill for 30 years. We are starting our training from scratch. However, there is an incredible enthusiasm in the country."

RBGE will be involved in a programme to identify key Biodiversity Areas in Iraq and this should result in protected areas and national parks across Iraq. RBGE will also be running an on-going series of training courses in all aspects of taxonomy, field techniques and biodiversity conservation etc.

In Afghanistan RBGE will also assist with a rangeland survey to identify plants and advise nomads on how and when to move their animals.

There are also plans to digitalise RBGE's herbarium collection so it can be accessed online from all parts of the globe. It will be a vital tool for plant identification.

The Centre for Middle Eastern Plants research focuses on floristic, systematic, molecular, bio-informatic and conservation studies in SW Asia. The group works closely with governmental organisations and institutes throughout the region and is actively involved in botanical, horticultural and conservation training and capacity building initiatives.



Teaching students how to use a flora key to identify plants

Institute of Aquaculture, University of Stirling

University of Stirling
Stirling FK9 4LA
Email: aquaculture@stir.ac.uk

NEW DIRECTOR



*Professor Brian Cross, Director of the
Institute of Aquaculture*

Professor Brian Austin has taken over as Director of the Institute from Professor Randolph Richards.

Professor Austin's research interests centre on fish pathology and marine biotechnology. Specifically, he researches the taxonomy, ecology, pathogenicity mechanisms (emphasising haemolysins and extracellular enzymes) and control strategies (principally vaccines and probiotics) for bacterial fish pathogens, especially aeromonads and vibrios. His work on marine biotechnology involves the development of novel antibiotics for the control of antibiotic-resistant strains of human pathogens, notably methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin resistant enterococci.

ETHICAL TRADING

Trade in farmed fish and shellfish between Asia and Europe has emerged as a major global business. While current EU policy supports this trade and seeks to ensure high food safety standards, consumers in Europe are increasingly seeking reassurance that their food is produced according to high environmental and broader ethical standards.

In one of the largest projects ever to receive funding in the Institute, the SEAT (Sustaining Ethical Aquatic Trade) consortium sets out to support producers in Asia to investigate and develop sustainable trade in their aquatic products. This will be realised through collaborative research with partners in Bangladesh, Thailand, Vietnam and China.

This project is a major collaboration between the **Systems and Development**, **Environmental Modelling** and **Geotechnology** groups in the Institute, in conjunction with the **Department of Marketing** and many key European partners and major Asian Institution.

CELEBRATING DISTINGUISHED SERVICE

Professor Randolph Richards CBE received the prestigious award for Excellence in European Aquaculture given by the Federation of European Aquaculture Producers (FEAP) at its annual meeting earlier this year. This award is made to a person who has excelled in their contribution to the development of European aquaculture.

It is one of many well deserved accolades Professor Richards has received over the last thirty years. During that time he has played



*Professor Randolph Richards, CBE, with the Excellence in European
Aquaculture Award*

a major role in the emerging aquaculture industry in Scotland, greatly benefiting the economy in the process.

As a leading fish disease specialist, he co-ordinated large EU research programmes on fish diseases, was a member of the UK's Veterinary Products Committee, which licenses all animal medicines and oversaw the development of medicines which helped control the potentially devastating problem of sea lice infestation.

Professor Richards' own reputation is recognised by his membership of the UK Research Assessment Exercise panel for 2008 and of the international panel of Norway's Research Council Centres of Excellence Scheme since 2001.

He has been recognised by the farming community with the award of the Fellowship of the Royal Agricultural Societies and last year received a prestigious award at the Aquaculture Today conference for his outstanding contribution to Aquaculture.

In 2008, he received the CBE; an award which reflects and pays tribute to outstanding achievement and service, right across the community and the nation as a whole.

Speaking of the changes in the aquaculture industry during the last thirty years, he said:

"It has been very rewarding to be involved in the groundbreaking developments which have taken place in Scotland and indeed worldwide, which have led to the establishment of a sustainable and efficient aquaculture industry.

"Production from traditional fisheries is at its limit and Aquaculture has filled the gap in providing healthy seafood products which are so essential to human health. The Institute of Aquaculture at the University of Stirling has played a lead role in this development and it is very rewarding to have been recognised in this way by FEAP."



Scottish Agricultural College



Ken Rundle

*Head of Communications, SAC
West Mains Road, King's Buildings,
Edinburgh EH9 3JG
Email: john.oldham@sac.ac.uk*

SCOTLAND LEADS

Scotland tops the world rankings in agricultural science. In the top 20 list of nations involved in agricultural science research, Scotland comes first, with England fourth, and the USA eleventh.

The data, collected for the Times Higher Education Supplement by US-based Thomson Reuters, involves research papers published in the last 10 years. The rankings are based, not on the number of papers produced, but the number of times the research is quoted in other research papers. Scotland's 11.9 "citations" per paper beat England's 9.75, America's 8.36 and 6.8 for New Zealand.

Professor Bill McKelvey believes this is significant. "It shows that the work being done in Scotland on subjects like climate change, animal welfare and agriculture resonates around the world. It is relevant research of the highest quality and something our nation can be proud of. Now we have reached this position, it is important we continue to invest in sound science, especially given the present political concerns over food security."

INTEGRATING RESEARCH & POLICY

Scientists should be more aware of policy challenges if they want to improve the chances of having research plans accepted. That was the clear message from a recent, two-day "Methodologies, Modelling and Measuring" conference held at SAC, Edinburgh in June 2009.

Organised jointly by the Association of Applied Biologists, the British Society for Animal Science and the Agricultural Economics Society it explored how best to provide evidence for policy makers interested



GREEN CATTLE

SAC has won a grant for research equipment worth some £1 million from the European Regional Development Fund (ERDF) and the Scottish Government. It will help research on reducing livestock greenhouse gas emissions. With the "GreenCow" equipment researchers can make accurate measurements of what the cattle take in and what they give out. The new facility is a significant addition to SAC's beef research capability.

Prof Geoff Simm – Academic Director designate at SAC and leader of the bid commented: "We need to double global food production over the next 50 years to feed the growing human population. However, we must also reduce the environmental footprint of food production, including greenhouse gas emissions. Cattle and sheep account for over a third of agricultural greenhouse gas emissions in the UK, but they also produce quality food products from the grass and forages that aren't for human consumption."

in climate change, food security, the impact of agriculture on the environment and animal health and welfare.

Professor Maggie Gill, Chief Scientific Adviser for Rural Affairs and Environment to the Scottish Government, challenged the assembled researchers to consider the policy makers' needs when formulating their research plans. Policy makers dislike conflicting information and often want quick answers to their questions. They see scientists as not only having a role in providing the answers to the questions but in framing the questions themselves.

ENVIRONMENTAL AUDIT

SAC economist Dr Dominic Moran has been invited to join a group making the first analysis of Britain's natural environment to identify the benefits it provides to society and our future economic prosperity.

The two-year UK National Ecosystem Assessment (NEA) will study the period from the end of World War 2 to 2060. The aim is to produce a compelling and easily understood explanation of the state and value of the UK's natural environment.

The UK NEA will cover land-based, freshwater and marine ecosystems, with descriptions for England, Scotland, Wales and Northern Ireland.

University of St Andrews



St Andrews
Fife KY16 9AX

OCEANS INSTITUTE

The **Scottish Oceans Institute**, which brings together over 300 staff from across the University of St Andrews, has been created to lead Scottish research of the ecology and evolution of marine life, biodiversity, fisheries, climate change, the environmental effects of renewable energy, oil and gas, shipping and related industrial processes.

The SOI is a multidisciplinary centre involving the Schools of Biology, Geology & Geosciences and the School of Mathematics & Statistics. SOI builds upon the international success of the Gatty Marine Institute, the Sea Mammal Research Unit (SMRU), and Centre for Research into Ecological and Environmental Modelling (CREEM), all of which will be participating in SOI.

SEALS LIKE IT HOT

Harbour seals, like most mammals, re-grow some or all of their hair each year. In a unique study, William Paterson of the Sea Mammal Research Unit (SMRU) followed two adult female seals from late pregnancy through pupping and then to the end of the moult period.

A joint team from the Sea Mammal Research Unit, University of Glasgow and Edinburgh Napier University used thermal imaging technology for the first time to measure the body surface temperature of two adult harbour seals as they hauled out of the water onto land.

Paterson's results give insights into the energy requirements of this species, some of whose UK populations have declined by up to 50% since 2000, and Paterson hopes that his study could also have positive implications for seal population monitoring.



Studying the Arctic ice from Greenpeace's Arctic Sunrise

SAILING WITH GREENPEACE

Dr Richard Bates, a geophysicist specialising in environmental geosciences, joined glaciologists and the Greenpeace crew aboard the Arctic Sunrise as they navigated the waters around Greenland to analyse the deterioration of the Petermann glacier.

The team took measurements to track different parts of the glacier and used time-lapse cameras and measurements of daily melt cycles to record glacier structural changes.

Large cracks have been forming over recent years, and now observations suggest that a piece the size of Manhattan Island is likely to break off very soon. The effect of this would be to 'unleash' the glacier – described as being like taking a cork out of a champagne bottle.

Measurements there have shown that at around 60 metres depth, the salinity of the water rises – indicating that warm ocean currents from further south in the Atlantic are accelerating the ice melt at a rate much faster than on the surface. The breakup of the Petermann glacier has implications for rising sea levels across the globe as well as for the Greenland ice sheet, as potential larger releases of frozen fresh water floods into the ocean.

BRIGHT FISH

A common species of fish found in Europe and across the UK is the 'genius of the fish world' according to researchers at the University of St Andrews. The new study has found that the way fish learn could be much closer to the human way of thinking than previously believed.

Researchers Kevin Laland and Jeremy Kendal believe the nine-spined stickleback could be the first animal shown to exhibit an important human social learning strategy. According to the study, nine-spined sticklebacks can compare the behaviour of others to make choices that lead to better food supplies.

The ability to pick the best quality food patch by comparing how successful others have been has not been shown before in animals. The researchers believe that the species were forced to learn from others because they cannot protect themselves from predators. Instead, they hide from predators while watching others find feeding locations.

Dr Kendal said, "These fish are obviously not at all closely related to humans, yet they have this human ability to only copy when the payoff is better than their own. You might expect this ability in animals that are closely related to humans. In the case of the nine-spined stickleback, they have most likely adapted to their local ecology."

In Brief...

VETAID AT THE SHOW



This year, VETAID's presence at the Royal Highland Show was more than in previous years. We had our own stand, and produced a photographic exhibition about farming in Tanzania.

The photos were taken by Scottish students on an exchange visit to Tanzania. The aim of the exchange was to raise awareness of the importance of farming to families in East Africa and to look at the issues affecting them.

VETAID works with agricultural communities in east Africa who depend on animals for their survival. In the course of our work over nearly 20 years, we have recognised the need for a holistic approach to tackling poverty among rural livestock-keeping communities in Africa.

VETAID was set up in 1989 by three postgraduate veterinary students at Edinburgh University. The charity was established to improve animal health by increasing access to better veterinary services in the developing world.

VETAID has four staff in our head office located at the **Moredun Research Institute** and over 45 staff in offices in the African countries we work in. For more information see www.vetaid.org.

CATCHING THEIR ATTENTION

The **SAC** Learning Team scored a successful double whammy this summer with an event that not only excited the next generation of scientists but used SAC's flexible learning skills to provide teaching materials which will enrich the school curriculum.

Nearly 100 sixth-year students attended a one-day event based at the **Moredun Research Institute** in Edinburgh. The young biologists were introduced to a morning of debates on topical subjects followed by afternoon visits to a number of science institutes in the Edinburgh area. Later that day there was the launch of the Higher/Advanced Higher Biology learning materials.

Schools throughout Scotland were invited to send sixth-year students interested in a career in the biological sciences. It drew groups from as far afield as Islay, Aberdeenshire, Dumfries and Galloway, the

Borders and the Central Belt. The **Moredun's Conference Centre** gave them the feeling of attending a mini-conference - totally different from other events they had attended.

They particularly enjoyed the debates covering topics such as GM crops, battery cages and climate change, all energetically argued by members of SAC staff. Students were asked to vote before each debate and then ask questions after each debate before voting again. There was often a fascinating change of opinion, but was it the subject matter or the debater who changed opinions?

The afternoon visits included the **SAC Animal Welfare Unit**, the **Dick Vet**, the **Moredun Institute Diseases Unit** or the **Scottish Agricultural Science Agency**. The scientific staff meeting the students tried hard to inspire them with information on current research work and the range of careers available in each institute.

STRESS SPEEDS AGEING

A lifetime of stress can take its toll on the body and accelerate the ageing process, a study of wild animals suggests. Scientists at **Edinburgh University's School of Biological Sciences** found that wild sheep forced to contend with difficult winter conditions tend to be more vulnerable to illness as they get older.

The study of Soay sheep on the island of St Kilda suggests that persistent or repeated stress has a cumulative effect on long-term health and ageing. Understanding the effects of stress may help scientists better understand the ageing process. As we get

older, our health tends to decline, but in addition to this, environmental factors make us age. Our age in terms of years may not correspond to the body's true age. In the case of the Soay sheep, exposure to stress may have an irreparable effect on their health.

CALEY LOOKS TO ITS ROOTS

The Heritage Lottery Fund is helping to fund an investigation into the background to the formation of the **Royal Caledonian Horticultural Society** in November 1809. Investigations so far have highlighted the significance of the pioneering experimental garden project developed in Edinburgh in 1824 on the site now occupied by the rock garden display area of the **Royal Botanic Garden Edinburgh**. It appears that the purpose of the garden was to experiment with the culture of plants appropriate to the Scottish climate and which had potential economic value.



ECRR DIARY 2009/10

Nov 11	Main Board & AGM meeting	St Leonard's Hall, Pollock Halls	15.00
Dec 7	Executive Committee	Royal Botanic Gardens Edinburgh	11.00
	Directors' lunch		12.30
2010			
Feb 1	Directors' Lunch	National Museums of Scotland	12.30
Feb 16	Annual ECRR Lecture	Royal Society of Edinburgh Speaker: Prof Jim McDonald	17.30
Mar 1	Executive Committee	TBA	11.00
	Directors' Lunch		12.30
May 5	Main Board meeting	Edinburgh University, College of Humanities & Social Sciences	11.00
	Directors' Lunch		12.30
Jun 4	Executive Committee	TBA	11.00
	Directors' Lunch		12.30
Sep 6	Directors' lunch	RSPB Vane Farm	12.30

PREDICTING CLIMATE CHANGE IMPACTS IN SCOTLAND

Scottish Climate Change Impacts Partnership in association with the Met Office is organising a Scotland Projections in Practice Week from 16-20 November 2009.

These events will provide training and guidance in using the UK Climate Projections and to assess the risk of climate change. There are two types of events focussing on specific themes.

- Five half-day **Practitioners' Workshops**, comprising a mixture of scene-setting presentations and group discussions which introduce the UKCP09 tools and user interface.
- Five technical full-day **User Interface Training Sessions** which provide hands-on training for users who wish to access the data for key figures or create their own maps and graphs.

For more information go to the web link <http://bookwhen.com/sccipevents>.

SCCIP was established to "increase the resilience of organisations and infrastructure in Scotland to meet the challenges and opportunities presented by the impacts of climate change". SCCIP is funded by the Scottish Government and the Scottish Environment Protection Agency. The SCCIP programme of work 2009-2011 is being delivered by the Scotland & Northern Ireland Forum for Environmental Research (SNIFFER).

ECRR Member Organisations

University of Edinburgh	www.ed.ac.uk
College of Science & Engineering	
College of Medicine & Veterinary Medicine	
College of Humanities & Social Science	
Scottish Agricultural College	www.sac.ac.uk
Research & Development	
Education & Training	
Heriot Watt University	www.hw.ac.uk
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Napier University, School of Life Sciences	www.napier.ac.uk/fhls
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UHI Millennium Institute	www.uhi.ac.uk
University Marine Biological Station Millport	www.gla.ac.uk/centres/marinestation
Moredun Research Institute	www.mri.sari.ac.uk
Forest Research, Northern Research Station	www.forestresearch.gov.uk
The Roslin Institute, University of Edinburgh	www.roslin.ac.uk
Biomathematics and Statistics Scotland	www.bioss.sari.ac.uk
British Geological Survey	www.bgs.ac.uk
Centre for Ecology & Hydrology Edinburgh	www.ceh.ac.uk
MRC Human Reproductive Sciences Unit	www.hrsu.mrc.ac.uk
National Museums of Scotland	www.nms.ac.uk
Royal Botanic Garden Edinburgh	www.rbge.org.uk
Royal Society for the Protection of Birds – Scotland	www.rspb.org.uk
Science & Advice for Scottish Agriculture	www.sasa.gov.uk
Scottish Crop Research Institute	www.scri.sari.ac.uk
Scottish Natural Heritage	www.snh.org.uk
Scotland & N. Ireland Forum for Environmental Research	www.sniffer.org.uk

CONTACTING ECRR

Scientific Director:	Professor Stuart Monro	Email: stuart.monro@dynamicearth.co.uk
Secretary/Treasurer	Mike Talbot	Email: m.talbot@bioss.ac.uk
Bush Telegraph Editor	Mike Steele	Email: mike.steele@sac.ac.uk

ECRR, University of Edinburgh, Room 3618, JCMB, King's Buildings, Edinburgh EH9 3JZ
Tel: 0131 650 4890 Fax: 0131 650 4901

FUTURE ISSUES

Contributions to the Bush Telegraph are welcomed. All contributions, comments and suggestions can be emailed to Mike Steele at mike.steele@sac.ac.uk.

DISTRIBUTION

For queries about Bush Telegraph distribution please contact Mike Talbot at mike.talbot@bioss.ac.uk.

ON THE WEB

Back issues can be viewed at <http://www.ecrr.org.uk>

COPY DEADLINE

Deadline for copy in the next issue is 1 December 2009