



International Exchange Bilateral Programme Case Studies

One of the main purposes of the RSE International Programme is to award short term travel grants to enable Scottish researchers to establish links with colleagues in other countries with a view to a long lasting collaboration, through joint publications and joint applications for longer term funds. These International Exchange Awards are available to all researchers of at least postdoctoral level, not only to Fellows of the RSE. These awards are perhaps particularly appropriate early-stage researchers to facilitate establishing international connections.

The International Exchange Bilateral Programme facilitates the collaboration between researchers from Scotland and those based in institutions with which the RSE has a formal Memorandum of Understanding. Exchange Programme grants are for short-term visits of one to four weeks duration, the key objectives being to enhance the research capabilities of individual researchers, develop international collaborative links, and enable participation in international research programmes.

Below are excerpts from reports of visits supported by the International Exchange Bilateral Programme.

THE CHINESE ACADEMY OF SCIENCES

Dr Paul Williams, School of Biological Science, University of Aberdeen

Visited: Prof Yongguan Zhu, Dept of Soil Environmental Sciences, Research Center for eco-environmental studies, Chinese Academy of Sciences, China



China is the world's premier rice producer and consumer. Dr Williams' grain market surveys, that utilized novel rapid speciation methodologies, were able to show for the first time that, in general, inorganic arsenic levels in rice obtained from major Chinese urban conurbations, were lower than commonly found in European, Japanese or US cities and were compliant with national food hygiene standards. However, a considerable number of rural poor are reliant on rice grown in close juxtaposition to major base and precious mining or processing facilities. Hunan Province (south-central China) has a high population density of rural workers with rice farming and mining forming the cornerstone of the local economy, with a population exceeding that of the UK's. Dr William's research revealed that there was extensive contamination of rice crops by arsenic, cadmium and lead in mining towns throughout Hunan. Dr Williams also identified that milled rice bran and husk, being used to feed livestock, would in many instances not conform to national hygiene standards.

The visit has been enormously productive, yielding numerous peer reviewed publications and achieving a more stable foundation from which further collaborative ventures between the University of Aberdeen and the Chinese Academy of Sciences

can develop. The collaborative research into the continued advancement of metal(loid) speciation techniques resulted in the development of a new rapid speciation extraction methodology, which can be used by safety regulators to assess the inorganic arsenic content of commonly available rice and rice based products, in China and in the UK.

[Image: The Chinese character for rice – composed from market-bought grain. Arsenic levels in the rice used in the picture vary from 60 ng/g to >400 ng/g.]

Dr Huabing Yin, University of Glasgow

Visited: Professor Li Cui, Institute of Computing Technology, Chinese Academy of Sciences, China

Supported by the international exchange programme award, Dr Yin's trip to visit several top research institutes in China was very successful. Dr Yin's collaborations with existing contacts (at the Chinese Academy of Science and Tsinghua University) have been substantially reinforced and new collaborations have also been initiated with two state key laboratories in China. The collaborations will focus on new sensor development for health care, combining the expertise of the University of Glasgow in micro/nanotechnology and Chinese partner's expertise in materials and information processing. Methods of both short-term and long-term research interaction have been established. Furthermore, seminars given in both of these institutes boosted the Chinese investigators' awareness of the research and teaching excellence at Glasgow University and their willingness to pursue their future study/work in Scotland.

THE ACADEMY OF SCIENCES OF THE CZECH REPUBLIC

Dr Eric Grist, Environmental Research Institute, UHI Millennium Institute

Visited: Professor Vlastimil Krivan, Department of Theoretical Ecology, Institute of Entomology, Czech Republic

The purpose of this visit was to develop a better understanding of the long distance movements of large marine animals with a view to enhancing ecological risk assessment of future tidal and wave energy developments which are being proposed for offshore sites in north Scotland.

Optimal foraging models are one of the main theoretical tools for predicting the diet and habitat distribution of organisms where multiple prey choices are available. In its most basic form, optimal foraging theory states that organisms forage in such a way as to maximize their energy intake per unit time. This exchange visit focused on the potential utility of optimal foraging model projections in helping to ultimately decide the best locations for offshore marine renewable energy sites in order to minimize collisions between ecological communities and marine renewable energy devices.



Initial data explorations into the relationship between distributions of the main prey species and the seasonal abundances of predatory seven-gilled shark were determined. These will provide vital information into the foraging behaviour of such large sharks

(which are a global species returning to coastal waters only to breed) and the likelihood of their presence on a seasonal basis under different prey abundance scenarios, which may change through prevailing climatic conditions.

As a result of this visit, joint publications are planned on optimal foraging behaviour of seven-gilled sharks and on ecological modelling approaches relevant to marine renewable energy development.

[Image: a young seven-gilled shark (*notorynchus cepedianus*) being measured and sampled for stomach contents data (the animal was returned to the wild unharmed)]

THE INDIAN ACADEMY OF SCIENCES

Scottish Based Hosts: Dr Susan Klein and Professor David Alexander, Aberdeen Centre for Trauma Research, Faculty of Health & Social Care, The Robert Gordon University, Aberdeen

Visitor: Dr Rajesh Sagar, Department of Psychiatry, All India Institute of Medical Sciences, India



Under the aegis of the RSE International Exchange Programme, a collaborative research proposal has been developed to (i) promote conceptual clarity and evidence-based practice in the field of disaster response, and (ii) inform the ongoing debate about how health officials and aid organisations attend to the collective recovery of the survivors (in particular with regards to meeting their longer term psychological and psychosocial needs in a culturally appropriate manner). Dr Sagar visited the Aberdeen Centre for Trauma Research at the invitation of the Centre's Director, Professor David Alexander, and his immediate colleague, Dr Susan Klein. Based on a two-year study, to

be conducted in the Tsunami affected Andaman & Nicobar Islands, the proposal will be submitted to the British Academy for funding.

[Image: Dr Rajesh Sagar with the Trauma Team of the Aberdeen Centre for Trauma Research. L-r Professor Alexander, Dr Yilmaz, Dr Sagar, and Dr Klein]

Dr Paul McNamee, Health Economics Research Unit, Institute of Applied Health Sciences, University of Aberdeen

Visited: Assistant Professor Akash Acharya, Centre for Social Studies, South Gujarat University Campus, India.

Deaths of mothers and babies during childbirth or shortly thereafter are high in many low and middle income countries, and are priority areas for health policy-makers. This research visit was initiated in order to learn more about the development of an innovative scheme in Gujarat State called Chiranjivi ('long life' in Gujarati), that seeks to reduce the number of deaths of mothers and babies, through lowering the financial costs incurred by poor mothers who deliver their baby with private (for profit) obstetricians. During the visit, semi-structured interviews were conducted with 7 private providers and 3 government health officials. These interviews provided

information about the extent to which the scheme is used, the reasons underlying use and non-use, changes in delivery of care following scheme participation, the management of funds and future financial viability. Further, current evaluations of the scheme were discussed, and future research needs identified.

Scottish Based Host: Dr Kay Tisdall, Reader, the School of Social and Political Studies, University of Edinburgh

Visitor: Prof Anita Rampal, Department of Education, Delhi University, India

Following an RSE funded visit by Professor Rampal to the University of Edinburgh in September 2006, a number of joint publications have been produced. These include publication of seminar papers in a special issue of the International Journal of Children's Rights (2008, 16(3)) (<http://www.ingentaconnect.com/content/mnp/chil>).

As a result of the visit, funding has also been secured from the Leverhulme Trust for building a network, "Theorising Children's Participation: learning across countries and across disciplines" (2008-2010). This is an academic network with colleagues at Oxford University and in Brazil, India and South Africa.

A less direct connection is a parallel workshop being funded by the European Science Foundation for European collaboration: "Children's Participation in Decision-Making: Exploring Theory, Policy and Practice across Europe" (2008) With Profession Manfred Liebel (Freie Universität Berlin).

THE POLISH ACADEMY OF SCIENCES

Scottish Based Host: Professor Hamlyn Jones, University of Dundee at SCRI

Visitors: Dr Piotr Baranowski, Institute of Agrophysics, Polish Academy of Sciences

Dr Baranowski visited the Dundee for two weeks in February to undertake collaborative experiments investigating new approaches using active thermography for detecting subsurface defects in fruit. New methods for fruit quality evaluation are needed because existing systems cannot effectively distinguish fruit with various kinds of internal damages, especially those which occurred recently. Both teams contributed equipment including a thermographic camera, thermal wave generator, lamps, thermometers, heat plates for evaluation of thermal properties, etc. Pulsed-Phase Thermography (PPT) was used to assess apple fruits, aiming to determine the depth of damage and to investigate the mechanism of thermal wave conduction through the skin and flesh. Many sequences of surface temperature dynamics were recorded and data concerning physical properties of the tissues were gathered. Preliminary analysis and discussion of the results was undertaken; further data analysis is underway for preparation of a common publication. Future co-operation plans were also discussed, including participation in preparation of common research projects within the EU framework programme 7.

Scottish Based Host: Dr David McKee, University of Strathclyde

Visitor: Assistant Professor Jacek Piskozub, Institute of Oceanology, Polish Academy of Sciences, Poland



In situ measurements of absorption and attenuation are subject to systematic errors due to artefacts associated with scattering from suspended particles. Dr McKee and Assistant Professor Piskozub have developed a new scattering correction procedure based on detailed modelling of the optical layout of the most popular commercial in situ spectrophotometer. Data processed with this new correction procedure will be used to provide improved interpretation of information from ocean colour satellites and to monitor changes in the marine environment from moorings, gliders and other in situ deployments.

[Image: IN situ optical instruments being deployed in the Bristol Channel from the Research Vessel Price Madog.]

Scottish Based Host: Professor Jenny Ozga, Director, Centre for Educational Sociology, The University of Edinburgh

Visitor: Dr Marta Moskal, Institute of European Studies, Faculty of International and Political Studies, the Jagiellonian University of Krakow, Poland

The travel grant supported Dr Moskal in working with Professor Ozga on background research for the development of research proposals designed to explore the experiences of the families and children of recently arrived Polish migrants in Scotland, with a particular focus on their experiences of schooling. The visit enabled Dr Moskal to become more familiar with the policy context in Scotland, and she was also able to identify the distribution of the new Polish community that is making use of the school system, and to make brief orientation visits to the three areas where the research will be carried out (Edinburgh, Inverness and Aberdeen).

As a result of the visit it has been possible to secure a Marie Curie Fellowship for Dr Moskal. Dr Moskal has now started work in the Centre for European Studies, at the University of Edinburgh, on her project on Polish Migrants in Scotland.

Scottish Based Host: Dr Peter Taylor, Principle Investigator, Division of Molecular Physiology, University of Dundee

Visitor: Dr Katarzyna Ruckemann-Dziurdzinska, Pathophysiology Department, Medical University of Gdansk, Poland

As a result of the collaboration established during the visit supported by the Royal Society of Edinburgh in July and August 2007, several actions have taken place. Dr Ruckemann-Dziurdzińska visited Dundee again in November 2007 and the research initiated over the summer was continued. During this visit a seminar "The LAT1 transporter-searching for a clinical dimension", originally planned for the previous visit, was delivered.

The research started in Dundee was continued in Gdańsk. The results were submitted as a poster for the workshop "Lymphocyte kinetics in Health and Disease" in London

organised by the Infectious Disease Research Network” (19-20 May 2008). Dr Ruckemann-Dziurdzińska attended the workshop.

Dr Taylor also visited Gdansk in June 2008. This visit was supported by the Erasmus Lifelong Learning Programme, and during the visit future joint research projects were discussed. The project started over summer 2007 is to be continued, and the next research visit to Dundee is planned for Autumn 2008.

THE SLOVENIAN ACADEMY OF SCIENCES AND ARTS

Dr Valentina Bold, Senior lecturer and Head of Scottish Studies, University of Glasgow

Visited: Dr Marjetka Golež Kaučič, Director, Glasbenoradopišni inštitut/ Institute of Ethnomusicology, Slovenian Academy of Sciences and Arts, Slovenia

Dr Bold was in Ljubljana to conduct comparative research on the cultural significance, and usage, of the Slovenian national poet, France Prešeren, and Robert Burns. She met with leading cultural experts, and attended the Prešeren celebrations in his birthplace, Vrba, and final resting place, Kranj. She delivered a public lecture in Ljubljana and was a participant-observer, performing a Burns song, at the annual Society of Slovenian-Scottish Friendship Burns-Prešeren Supper. Dr Bold was able to draw parallels about the significance of both poets as cultural (and particularly language) carriers, and on their importance as symbols of nation in small nations who have recently undergone political changes and self-controlled redefinitions. Dr Bold was also able to review the use of Prešeren in 2000, the year of Slovenian Culture, and anticipate parallels with the use of Burns in 2009, Scotland’s Homecoming Year. Collaborations with the Institute of Ethnomusicology in Ljubljana, relating to Scotland and Slovenia also took place, which Dr Bold hopes will result in the delivery of a postgraduate degree within the Erasmus Mundus programme: ‘European Cultural Heritage’, encouraging inter-cultural research between Scotland and Slovenia.

Dr Emily Lyle, Celtic and Scottish Studies, University of Edinburgh

Visited: Dr Marjetka Golež Kaučič, Institute of Ethnomusicology, Scientific Research Centre of the Slovenian Academy of Science and Arts, Slovenia

Dr Lyle’s research visit to Slovenia was for the purpose of exchanging views and information on Indo-European mythology, a field in which there has been considerable divergence between Slavic and Western approaches. There is valuable common ground, however, in terms of structure, which is of especial importance in Dr Lyle’s research and publications, and has been a strand in the thinking in Eastern Europe associated with structural studies in linguistics. Dr Lyle was able to lay out her ideas in a set of eight lectures and receive responses to them, and she has submitted an article on “Time and the Indo-European Gods in the Slavic Context” (based in part on researches during the visit) to *Studia Mythologica Slavica* which is published in Ljubljana. Dr Lyle also gave a public lecture on “The Scottish Fairy Ballads”, which was of special interest to those who had a concern with literature, music and folk tradition.

THE NATIONAL SCIENCE COUNCIL OF TAIWAN

Scottish based host: Dr Stuart Gibb, Environmental Research Institute, UHI Millennium Institute

Visitor: Professor Chon-Lin Lee, Department of Marine Environment & Engineering, National Sun Yat-sen University, Taiwan

During Professor Lee's visit to Scotland, visits took place to the Scottish Association for Marine Science (SAMS), Oban, UHI Executive Office, Inverness and the Environmental Research Institute, Thurso. There was a familiarisation tour of SAMS with Dr Anuschka Miller and a welcome from the Director, Professor Graham Shimmiel FRSE. In Inverness a meeting was held with Professor Robert Cormack, Principal, UHI Millennium Institute, and in Thurso meetings were held with a number of staff and the visitor was given a tour of the research facility. Overall the visit was considered highly successful by both sides and it was a platform from which further collaboration can be developed.

Following the visit a Memorandum of Understanding is to be signed between the ERI and the Department of Marine Environment & Engineering. The MoU records the intention to promote academic, educational and technical exchange between the institutions through staff and student exchanges, co-operative research and exchange of academic materials.

Dr Francois Muller, Environmental Research Institute, UHI Millennium Institute

Visited: Professor Chon-Lin Lee, National Sun Yat-Sen University and Dr Tien-His Fang, National Taiwan Ocean University, Taiwan

This visit allowed the Scottish and Taiwanese partners to combine their efforts and analytical methodologies towards a better understanding of the behaviour and transport pathways of terrestrial humic substances in the marine environment. These substances carry substantial amounts of nutrients, contaminants and essential trace elements from land to sea, potentially influencing the ecology of an entire coastal region.



Seawater samples were collected off the north coast of Scotland in September 2008. Frozen portions of these samples were flown to Taiwan the following month. Laboratory experiments were conducted which included direct fluorescence measurements as well as time-series experiments in which changes in the metal-binding properties of humic substances were tracked over time.

Two Taiwanese PhD students have now been invited to carry out field and laboratory work in Thurso in March–May 2009. Their planned work will focus on the binding of organic pollutants to colloids found in suspension within a river plume, and how this binding changes as the water mass travels seawards from the river mouth.

[Image: Seawater samples from Thurso Bay, Scotland, were flown to Kaohsiung Bay, Taiwan, where their fluorescence properties were recorded before and after changes in trace metal concentration levels.]