

# Scott Polar Research Institute Review 2011

85th Annual Report of the  
Scott Polar Research Institute  
University of Cambridge, UK



**Scott Polar Research Institute**  
University of Cambridge



**UNIVERSITY OF  
CAMBRIDGE**



*The facade of the Institute*



## Contents

Director's Introduction .....	2
Institute Staff .....	4
Polar Research .....	6
Research Group Structure	
Polar Physical Science	
Polar Social Science and Humanities	
Current Research Grants	
Publications by Institute Staff .....	14
Books	
Papers in Peer-Reviewed Journals	
Chapters in Books and Other Contributions	
Doctoral and Masters Theses	
Seminars	
Polar Information and Historic Archives .....	17
Library and Information Service	
World Data Centre for Glaciology, Cambridge	
Picture Library	
Archives	
<i>Polar Record</i>	
SPRI Website	
Teaching, Learning and Understanding .....	20
University Teaching	
The Polar Museum	
Education and Outreach	
Projecting the Significance of the Polar Regions	
Expedition Support: Gino Watkins Funds	
External Contributions to Polar Activities .....	23
National and International Roles of Staff	
International Glaciological Society (IGS)	
Scientific Committee on Antarctic Research (SCAR)	
Fundraising and the SPRI Appeal .....	24
Friends of the Scott Polar Research Institute	
SPRI Appeal	

## Director's Introduction

During 2011, staff of the Institute have led or participated in a number of field projects in both the Arctic and Antarctic. The growing significance of environmental changes that are affecting the Greenland Ice Sheet is reflected in the three parties from the Institute that undertook scientific projects there during the year. An extensive set of airborne geophysical measurements was acquired over the fast-flowing outlet glaciers draining westward from the ice-sheet crest during a two-week operation in April. The radar and laser data will allow us to reconstruct not only the thickness and bed topography of these glaciers, but also to make inferences on the presence of water and soft-sediment at the bed which control the rate of flow. Changes in the velocity structure of these major outlet glaciers, and increases in ice loss through iceberg production, are an important reason why global sea-level is rising today. In Cambridge, we are also utilising these observations to guide our numerical-modelling work on the prediction of how these glaciers may respond to future environmental change. Over the same period, measurements of snow density were being made close to the ice-sheet crest in order to calibrate satellite radar-altimetric data which allow the quantification of thickening or thinning of the ice sheet to an accuracy on the order of a few tens of centimetres; again, this information relates to the changing volume of the ice sheet with implications for sea-level change. During the summer, a further group from SPRI worked on the nature and rate of surface-meltwater production, lake drainage and its impact on the velocity of the ice sheet; the amount of surface melting in Greenland has increased greatly in the past decade. Each of these field programmes has been in collaboration with scientists from other British and American universities, with almost one million pounds of funding having been won competitively from the UK Natural Environment Research Council to support the work.

Elsewhere, our research staff have been active in collecting marine-geophysical data together with a Norwegian group north and east of Svalbard; this will yield evidence on the extent and flow of ice at the Last Glacial Maximum about 20,000 years ago. The Director also worked in the Windless Bight area of Antarctica, close to New Zealand's Scott Base, during December in collaboration with Gateway Antarctica at the University of Canterbury in Christchurch. SPRI staff and research students studying Arctic social sciences have also been active in the North; extended visits to communities in Greenland and Siberia, together with participation in traditional hunting and herding activities, have taken place. It is important to much field research in the social sciences and humanities that the researchers spend extended periods with the

indigenous groups they are studying, living under local conditions in all seasons and learning indigenous languages; field programmes in this area of the Institute's activities are often measured in months rather than weeks.

In February, the Institute hosted a visit from HRH The Duke of Edinburgh, marking the end of his period as Chancellor of the University of Cambridge. Prince Philip was briefed on the environmental implications of high-latitude climate change during a lunch-time discussion with senior academic staff. He then toured the Polar Museum, where he viewed exhibits on both the contemporary environmental significance and history of the Arctic and Antarctic. His Royal Highness has supported a number of Institute activities during his time as Chancellor, including the generous loan of his collection of Edward Seago's Antarctic paintings on two occasions.

Several events and exhibitions to mark the centenary of Captain Scott's *Terra Nova* expedition to Antarctica have also been held in the Institute's Polar Museum during 2011. Exactly one-hundred years to the day from the meeting of the *Terra Nova* and Amundsen's *Fram* in the Ross Sea, a series of historical and scientific talks took place sponsored by the Royal Norwegian Embassy. This was followed by a celebration dinner attended by both British and Norwegian descendants of those aboard the two ships. The collaboration of both the Norwegian Embassy in London and the Director and staff of the Fram Museum in Oslo was much appreciated in the organisation of this event. Later in the year, the Fram Museum also loaned many items into our exhibition on Roald Amundsen in the centenary year of his South Pole expedition; this is thought to be the first exhibition in the UK to have the Norwegian explorer as its focus. This exhibition was replaced, from December, by 'These Rough Notes', where diaries, artefacts, painting and photographs of Captain Scott's last expedition that are not displayed in our permanent exhibition space will be on view for a five-month period around the centenary of Scott's achievement of the Pole. Also on display was Scott's diary, kindly loaned from the British Library, open at the very last entry: 'For God's sake look after our people'.

Our newly reopened Polar Museum has been an excellent focus for these centenary exhibitions, as well as others on Inuit Dolls and the British Graham Land Expedition of 1934-37. The opening of the latter was attended members of the family of John Rymill, who led the expedition. Visitor numbers over the past year have approached 50,000, and our programme of public outreach to both adults and schoolchildren

has continued to grow and develop. Outreach events included the annual Cambridge Science Festival and the summer-holiday 'Cool Club' where children met Institute scientists. Our staff have also been busy with requests to film, interview and record in the Institute, and to use the historic photographs from our Picture Library, linked to the Scott centenary. In the autumn, the UK Antarctic Monuments Trust unveiled a new oak sculpture in the Institute gardens in remembrance of those who have died in the pursuit and enabling of science in Antarctica since the 'heroic era'; the families of many of those who are remembered were at the ceremony.

It is a great credit to our staff, and those generous donors who helped to fund the refurbishment project, that the Institute's Polar Museum was one of four

museums shortlisted for the prestigious Art Fund Prize this year; this was a very significant achievement, providing important national recognition. Scientific recognition also came for the Director through the award of the Louis Agassiz Medal of the European Geosciences Union, presented in Vienna in April.

My thanks go to the staff of the Scott Polar Research Institute, together with our groups of museum, library and archive volunteers, for the efforts they have put into making possible the range and quality of work that we undertake.



**Professor Julian Dowdeswell**

*The Director discussing climate change with the Vice-Chancellor, President Barroso of the European Commission and HRH The Duke of Edinburgh in the SPRI Museum*





## Institute Staff

### Senior Academic and Related Staff

Professor Julian Dowdeswell	Director and Professor of Physical Geography
Dr Neil Arnold	University Senior Lecturer
Dr Paul Berkman	Senior Research Associate (to June)
Dr Michael Bravo	University Senior Lecturer
Dr Poul Christoffersen	University Lecturer
Mrs Heather Lane	Librarian and Keeper of Collections
Professor Elizabeth Morris, OBE	Senior Research Associate
Dr Gareth Rees	University Senior Lecturer
Dr Ian Stone	Editor, Polar Record
Dr Piers Vitebsky	Assistant Director of Research
Dr Ian Willis	University Senior Lecturer

### Research Staff

Mr Toby Benham	Research Associate
Dr Marion Bougamont	Research Associate
Mrs Evelyn Dowdeswell	Research Associate
Dr Janne Flora	Research Associate
Dr Marga Garcia	Research Fellow
Dr Kelly Hogan	Research Associate
Dr Stephen Pax Leonard	Research Fellow
Dr Shane McCorristine	Research Fellow
Dr Ruth Mugford	Research Associate
Dr Stephen Palmer	Research Associate
Dr Olga Ulturgasheva	Research Fellow

### Library, Archive and Museum Staff

Ms Katherine Antoniwi	Education and Outreach Officer (to February)
Ms Naomi Boneham	Archives Manager
Ms Fiona Cahill	Conservator (to September)
Mrs Georgina Cronin	Library Assistant
Mr Bryan Lintott	Exhibitions Officer
Ms Lucy Martin	Picture Library Manager
Ms Shirley Sawtell	Information Assistant
Ms Hilary Shibata	Antarctic Bibliographer
Ms Willow Silvani	Documentation Assistant
Ms Kay Smith	Museum Project Manager
Ms Rebecca Stancombe	Library Assistant
Mrs Isabella Warren	Russian Bibliographer
Ms Sophie Weeks	Education and Outreach Officer (from May)
Mr Jeremy Wong	Arctic Bibliographer

### Support Staff

Mr Grahame Adley	Maintenance (from February)
Ms Rosie Amos	Saturday Museum Assistant
Mrs Danielle Feger	Administrator
Mrs Kate Gilbert	Director's Assistant/Institute Administrator
Ms Jamie Horsley	Administrator (to November)
Ms Marion Jeffries	Maintenance
Ms Claire Lampitt	Receptionist/Secretary (to September)
Mr Martin Lucas-Smith	Web Manager
Mrs Maria Pearman	Senior Clerk
Mr Roy Smith	Maintenance

Ms Narelle Baker  
Ms Alison Banwell  
Ms Christine Batchelor  
Ms Amy Donovan  
Mr William Eucker  
Mr Peter Evans  
Mr Jorge Guzman  
Ms Tania Kossberg  
Ms Terto Kreutzmann  
Ms Evelyn Landerer  
Mr Adrian McCallum  
Ms Jackie Price  
Ms Dinah Molloy Thompson  
Mr Martin O'Leary  
Mr Allen Pope  
Mr Tim Reilly  
Mr Cameron Rye  
Ms Katya Shipigina  
Mr Laur Vallikivi  
Ms Claire Warrior

Mr Martin Debusmann  
Mr Jan De Rydt  
Ms Madaleine Geddes-Barton  
Ms Lauren Grey  
Mr James Macadam  
Ms Alex Messarli  
Mr Andrew Tedstone  
Ms Natalie Thompson  
Ms Alison Weisburger

## World Data Centre for Glaciology, Cambridge

International Glaciological Society

## Scientific Committee on Antarctic Research

Dr Michael Sparrow	Executive Director
Dr Renuka Badhe	Executive Officer
Dr Eoghan Griffin	Project Officer (from October)
Mrs Rosemary Nash	Senior Clerk

Dr John Ash  
Dr Lawson Brigham  
Dr Liz Cruwys  
Dr Fiona Danks  
Dr Bob Hawley  
Mr Robert Headland  
Dr Neil Kent  
Dr Elena Khlinovskaya Rockhill  
Dr Beau Riffenburgh  
Dr Florian Stammer  
Dr John Tichotsky  
Dr Olga Tutubalina  
Dr Emma Wilson

Dr Peter Clarkson, MBE  
Mr Michael Gorman  
Mr Harry King  
Dr Simon Ommanney  
Professor Larry Rockhill  
Dr Bernard Stonehouse  
Dr Colin Summerhayes  
Dr Charles Swithinbank  
Dr Janet West  
Professor Peter Williams



# Polar Research

## Research Group Structure

The research work of the Institute continues to focus around its research groups, each of which has a mix of senior academic staff, post-doctoral researchers and a students. The work of the groups is supported by a number of externally funded research grants, which are listed below. The groups are:

- Glaciology and Climate Change
- Glacier-Influenced Marine Sedimentary Environments
- Polar Landscapes and Remote Sensing
- Anthropology and Russian Northern Studies
- Circumpolar History and Public Policy

Institute staff organise seminar series in both polar physical sciences and social science and humanities. Speakers from universities and research centres in the UK and overseas, together with Cambridge colleagues, have contributed during the year. The seminars are well attended by staff and research students from a number of Cambridge departments and from, for example, the British Antarctic Survey. A selection of the physical and social science research projects in which we are currently engaged is outlined briefly below.

*Scientists camp below Mt. Erebus, McMurdo Sound, Antarctica*







*Mountains protrude through the ice sheet in Victoria Land, Antarctica*

## Polar Physical Science

### Microwave remote sensing of thaw lake dynamics

Anna Maria Trofaier continued her doctoral investigation of the seasonal fluctuations of permafrost thaw lakes using images from the European Space Agency's Advanced Synthetic Aperture Radar (ASAR) on the Envisat satellite. The use of radar imagery for studying this highly dynamic phenomenon (thaw lakes can fill and drain in a few weeks) is particularly attractive because, unlike visible-wavelength or thermal infrared imagery, it is not affected by the presence of cloud cover or the absence of daylight. The current study area is located on the Yamal Peninsula, Russia. Preliminary analysis has confirmed the suitability of ASAR data

for identifying thaw lakes and monitoring changes in their extent. These results were presented at the ESA DUE Permafrost Workshop, held at the University of Alaska, Fairbanks, in February and at the European Geosciences Union's General Assembly meeting in Vienna in April. We are now broadening the geographical extent of the study to include comparable and contrasting sites in Alaska. This work is being undertaken in collaboration with Dr Annett Bartsch and her colleagues at the Institute of Remote Sensing and Photogrammetry, Vienna University of Technology.

**Anna Maria Trofaier and Gareth Rees**

*Basler DC3, with under-wing radar antenna for sounding ice thickness, landing at Ilulissat in West Greenland*



## Spectral and physical characterisation of glacier surfaces

The relationship between the optical properties of a glacier surface and its physical characteristics has been investigated by the collection of spectral reflectance data from the Langjökull ice cap in Iceland, providing a comparison with similar data collected from Midre Lovénbreen, Svalbard, in 2010. These data are of exceptionally high spectral resolution, covering the spectrum from a wavelength of around 400 nm, which is in the ultraviolet region, to 2400 nm, well into the infrared, with an effective resolution of

around 10 nm. This gives much more spectral detail than is available from most existing or planned satellite imaging instruments, and is providing important insights into the scope that such instruments offer for drawing inferences about the surface characteristics, and ultimately mass balance, of glaciers. Initial results were presented at the American Geophysical Union's Fall Meeting in San Francisco.

**Allen Pope and Gareth Rees**

## The seismic architecture and geometry of grounding-zone wedges formed at the marine margins of past ice sheets

The grounding-zone of glaciers and ice sheets is where their marine margins cease to be in contact with the sea floor. It is important both glaciologically and geologically. Mass is lost at the grounding-zone through iceberg production and melting, with the latter taking place at both ice cliffs marking the marine ice-sheet margin and at the base if the ice sheet becomes ungrounded as an ice shelf and is exposed to ocean water. During the environmental oscillations of the Quaternary and earlier glaciations, the location of the grounding-zone has responded sensitively to climatically-induced changes in ice thickness and sea level. In addition, where fast-flowing ice streams are present, the grounding-zone is a major focus for sediment delivery at the marine margins of ice sheets.

Subglacial debris is transferred across the grounding-zone from deforming sedimentary beds. Subglacial meltwater channels may also provide point sources of sorted sediments to the grounding-zone. Grounding-zone wedges, formed by these processes of rapid sediment delivery to the ice-ocean interface, are up to  $10^3$  km<sup>2</sup> in area and  $10^3$  km<sup>3</sup> in volume. The wedges are important indicators of past ice-sheet dynamics in the geological record and allow former positions of the grounding-zone to be identified. This, in turn, provides independent geological evidence against which the predictions of time-dependent numerical ice-sheet models can be tested. This research was undertaken in collaboration with Dr Edith Fugelli of BP Norway.

**Julian Dowdeswell**

## Hydrology and dynamics of the Greenland Ice Sheet

Predicting the response of the Greenland Ice Sheet to future warming requires improved understanding of the links between surface hydrology, basal hydrology and ice-sheet dynamics. We are developing a hydrological model that can be used to calculate patterns of melt across the ice sheet, the routing of surface water into depressions, where they may form lakes, the drainage of those lakes to the base of the ice sheet, and the routing of water across the bed to the ice-sheet edge. The model is applied to the Paakitsoq / Swiss Camp region of West Greenland. Recent model developments include a novel surface routing and lake filling / overflow algorithm that can be used to calculate supraglacial water discharge, the changing area and water volume of surface lakes that form in depressions, and the timing of lake overflow. We collected stream and lake-level data on the ice sheet over a three-week period in June 2011 to calibrate the model. Data show that lakes drain either

by overflow and the delivery of water to nearby shafts (moulins) into the ice ("slow drainage"), or by hydro-fracture and the sudden injection of large volumes of water to the ice-sheet base ("fast drainage"). One lake reached a maximum volume of  $\sim 1.5 \times 10^6$  m<sup>3</sup> (equivalent to 600 Olympic swimming pools) which then drained in 2½ hours. During drainage, the maximum water discharge entering the ice sheet was nearly 600 m<sup>3</sup> s<sup>-1</sup> (around 10 times the discharge of the River Thames, London). Analysis of dGPS data collected around the lakes shows that both "slow" and "fast" drainage affect the horizontal and vertical movement of the ice sheet, but in different ways. The work is being undertaken with PhD student Alison Banwell, and in collaboration with Dr Marco Tedesco (City College of New York) and Dr Andreas Ahlstrøm (Geological Survey of Denmark and Greenland).

**Ian Willis and Neil Arnold**

## Cryosat

Liz Morris continued her participation in an international programme to validate data collected by a new radar altimeter (SIRAL) carried by the Cryosat-2 satellite, launched this year. A repeat traverse along the EGIG line on the Greenland Ice Sheet was made in summer 2011, during which measurements of

snow-density profiles were made with an automated neutron-profiling system using access holes installed in 2010. This completed the series of measurements begun in 2004 and has provided a unique set of direct determinations of strain rate in polar snow.

**Liz Morris**



## Modelling glacial meltwater-plume dynamics and sedimentation in high-latitude fjords

A numerical model, *SedPlume*, has been developed to simulate deposition of suspended sediment from meltwater plumes emerging from tidewater-glacier margins. Turbid meltwater entering a fjord from a subglacial channel rises as a buoyant plume due to salinity and temperature contrasts with the fjord water. A model is formulated for the conservation equations of volume, momentum, buoyancy and sediment flux along the path of a turbulent plume injected into stratified marine water. Sedimentation occurs from the plume when the sediment fall velocity is greater than the entrainment velocity. Flocculation, the aggregation

of individual silt and clay particles, is modelled using empirical measurements of particle settling velocities in fjords to adjust the settling velocity of fine-grained sediments. The *SedPlume* model has been applied to McBride Inlet in Alaska, a temperate glaciated fjord where the majority of sedimentation originates from meltwater sources. The model predicts rates and patterns of sedimentation in good agreement with observations. This research has been published recently in the *Journal of Geophysical Research*.

**Ruth Mugford and Julian Dowdeswell**

## New insight to the dynamics of Antarctic ice streams

Research on glacier dynamics at SPRI has produced a new representation of subglacial processes in a 3-dimensional ice flow model. The improved model physics allow thermo-mechanical interactions between ice-flow dynamics and subglacial processes. Application of the improved model reveals hitherto unsimulated and significant complexities in the flow of Antarctic ice streams. In a paper published in the *Journal of Geophysical Research* in 2011, the researchers show that slight changes in subglacial hydrology may have a profound effect on fast

ice-stream flow, a key new finding in light of the recent discovery of interconnected subglacial lakes beneath many ice streams in Antarctica. The study also demonstrates how ice streams may possess a 'memory', insofar as their contemporary behaviour is governed by basal properties shaped by past aspects of flow and physical condition. The publication was selected as an Editors' highlight and a contribution of special significance.

**Marion Bougamont and Poul Christoffersen**

## Green Scholarships at the Scripps Institution of Oceanography

The Green Foundation, which supports research at the Institute of Geophysics and Planetary Physics across the University of California, awarded two Green Scholarships to researchers at SPRI in 2011; to Drs Poul Christoffersen and Marion Bougamont. The scholarships were funded with the aim of integrating ice-sheet modelling at SPRI with research on subglacial lakes by Prof. Helen Fricker and associated researchers at the Scripps Institution of Oceanography.

The collaborative research, which took place over a four-month period at the Scripps Institution of Oceanography, enabled the researchers to link modelling of subglacial hydrology with modelling of ice flow and basal processes. The coupled models are now being applied to Antarctic ice streams, with simulations running on the Darwin Supercomputer in Cambridge University.

**Poul Christoffersen and Marion Bougamont**

*Ice cliffs of the Austfonna ice cap, eastern Svalbard*



### Words and silence: Nenets reindeer herders' conversion to evangelical christianity

As the first ethnography of religious conversion in the contemporary indigenous Russian North, this is a major contribution to anthropological debates about the globalisation of Christianity. Analysis focused on the introduction of a new language ideology based on an ideal of truthful speakers who use words to reflect their 'inner' selves. Christian language not only offers tools for radical self-refashioning but also provides novel ideas and dispositions about agency, authority, morality, personhood, and time. Conversion offers a distinctive path to global forms of modernity. Unlike almost every person in the Soviet Union, these particular small Nenets nomadic communities

remained outside state institutions like school, army and the collective farm, and it was only in the post-Soviet period that they were registered as citizens at all. The missionaries also have their own history of martyrdom and persecution by the state, and bring an alternative regime of obedience and claims of universal truth which promises to change the herders on the spiritual level. Thus, the herders are led to burn their ancestral sacred items and abandon 'devilish' practices like drinking reindeer blood. Vallikivi's research was funded by the Gates Foundation and the Estonian government.

**Laur Vallikivi and Piers Vitebsky**

### Loneliness and opportunity for Greenlandic students in Denmark

Janne Flora took her ongoing study of relatedness and loneliness in Greenland in a novel direction, by conducting fieldwork among Greenlandic students who move to Denmark for the political purpose of eradicating Greenland's reliance on imported Danish professionals. By distinguishing cultural ideas of more- and less-desirable forms of separation and solitude, her study reveals a stark contrast in ideas according to social circumstances and regional origins. Young people, often male, from remote villages cite fear of displacement from land, separation from kin, and loneliness as reasons for not travelling to Denmark. But young people from the capital, Nuuk, usually female, are keen to go there in quest of anonymity and 'freedom' from intricate local kinship obligations.

These findings have important implications for demography and mental-health policy, and resonate closely with Olga Ulturgasheva's recent research contrasting indigenous youth brought up in more and less remote locations in Siberia. Here, too, attachment to land and kin keeps young people at home, and girls are more oriented to a distant metropolis than boys. This continuation of SPRI's longstanding research programme on family dynamics in the Arctic underlines the need for policy to be based on painstaking fieldwork and analysis at the community and family level. Flora's research was funded by the Carlsberg Foundation.

**Janne Flora, Olga Ulturgasheva  
and Piers Vitebsky**

*Dog teams and sledge on the sea ice in northern Greenland*







*Halibut drying in the isolated NW Greenland village of Qaanaaq*

## Walking with reindeer: place and movement in Siberia

Evelyn Landerer completed 15 months of fieldwork in Irkutskaya Oblast' in Siberia. In this region, Evenki hunters do not ride reindeer but walk around the taigá forest, using reindeer only for carrying baggage. By walking with them every day over thousands of miles and learning their forest skills, Landerer studied how hunters conceptualise, perceive and order their movements, and how this influences their attachment to places. Developing Vitebsky's work on Eveny reindeer migration and Basso's classic work on Apache narrative, she relates the good performance of skills to concepts of morality. To understand the functioning of winding paths in dense forest, she also develops comparable work from the tropical rainforest, which

shows how distant places are known from their sound rather than by being seen from afar. Both space and morality are changing rapidly, however. The hunters' narrow winding paths are now being crosscut by the wide clearcut tracts of geologists and oil prospectors. When following these tracts, hunters cannot look far ahead as they find the sheer straight perspective intimidating and alienating. Landerer's approach is phenomenological, but its strong empirical base and her own embodied experience allows her to critique as well as build on Ingold, Cresswell and other theoreticians of space.

**Evelyn Landerer and Piers Vitebsky**

## Indigenous security and sovereignty in the Arctic

Governance held by Inuit in, and on behalf of, Nunavut settlements in the eastern Arctic region of Canada takes multiple forms. This research takes direction from the multiple ways the term 'wellness' is used to express Inuit notions of security and sovereignty in the Arctic. The term offers a practical insight into how governance is understood from multiple orientations. For the purposes of this research, wellness can be understood from the perspective of everyday experience. The term also provides a space in which the multiple readings of nationalism of Nunavut and Inuit can be explored. Research suggests that the term wellness is central to understanding the multiple tensions that exist around

governance with and within Nunavut. These tensions are the result of the multiple political communities, and nationalisms; therefore, what is required is a fuller articulation and critique of the dominant pathways between nationalisms across regional, territorial, national and international scales. Drawing heavily from feminist discourse, this research has revealed notions of space and place understood from the outward global-focused perspectives of Inuit populations who, with self-determination, continue to live within vibrant Nunavut settlements.

**Jackie Price**

## The Inuit Northwest Passage Project

The Northwest Passage is an integral part of Canada's territory and identity. Its place in the geographical imagination is, however, as a highly complex construction. Originally conceived by Europeans as a utopian space, it has been the subject of competing cultural, historical and legal understandings. Whereas Europeans viewed the waters of the Arctic archipelago in terms of narratives of sovereign and national power, and of sea ice as an obstacle to navigation, the Inuit conceived of the Arctic and its waters as their homeland, and of sea ice as a surface that, attached to the land, allowed for travel and extended access to food. The project is a unique study of the Northwest Passage because it focuses on the philosophical understanding of these waters and their practical use by Canada's Inuit. Through ethnographic and historical research, the investigators are trying to establish how far Inuit in the Pond Inlet area were historically involved in the use and exploration of the Arctic. Fieldwork was carried out in summer 2011 in collaboration with Pond Inlet elders to map

key traditional routes or trails across the strait and connecting with other Inuit groups in all directions (including northern Greenland). The findings will be a first step towards understanding to what extent Inuit identity, with its known links to places of birth and occupancy in the Baffin region, extend much further into other Inuit regions along the Northwest Passage. A key aim is to establish the cultural significance of such a network, taking into account that trails have been used at different times by different peoples, and never integrated into a standardized cartographic system. The empirical fieldwork proposed here represents only a first step in acquiring and weighing the evidence in support of this hypothesis. The project is based at SPRI and Carleton University, and is co-directed with Claudio Aporta. We also wish to acknowledge the invaluable work of the Inuit Land Use and Occupancy Study as well as the recent work of Canadian colleagues.

**Michael Bravo and Claudio Aporta**

## Hearing the *Aurora Borealis* in nineteenth-century Arctic exploration and science

In western scientific traditions the *Aurora Borealis* has been a fiercely contested site of inquiry with little agreement as to its nature until the twentieth century. In this research, a survey of the history of auroral science up to the nineteenth century posed a set of research problems about traditional indigenous/western dichotomies regarding supernatural or anomalous experiences. Important sources were occasions when nineteenth-century Arctic explorers, scientists, and other travellers became enchanted by the *Aurora Borealis*. When explorers and scientists engaged with first-hand accounts of auroral sounds

gathered in the field from local informants, they attempted, though with difficulty, to disenchant certain claims through scientific observation. However, if this is looked at through the lens of cycles of re-enchantment, rather than sudden disenchantment, the position of the scientific observer becomes disturbed, destabilised, and subject to historical unpacking. This research contributes to rethinking how the tensions and ambiguities inherent in western approaches to the supernatural should be understood.

**Shane McCorristine**

*Fishing boats in the frozen Ilulissat harbour, West Greenland*





## Current Research Grants

Staff of the Institute currently hold research grants of almost £3 million, of which about £950,000 is from the UK research councils.

### Grants from UK Research Councils

*Airborne geophysical investigations of basal conditions at flow transitions of outlet glaciers on the Greenland Ice Sheet*

Source: Natural Environment Research Council, Grant NE/H020667/1  
£840,000 (2010–13)

*Determining the dynamic response of the Greenland Ice Sheet to climatic forcing using a geophysical, remote-sensing and numerical modelling framework*

Source: Natural Environment Research Council, Grant NE/G00692X/1  
£93,018 (2009–2012)

*Airborne geophysical exploration of central East Antarctica*

Source: Natural Environment Research Council, Grant NF/F016646/1  
£11,250 (2008–2012)

### Grants from Other Sources

*Arctic glaciers and their response to environmental change*

Source: John Ellerman Foundation  
£90,000 (2008–2011)

*Environmental Security in the Arctic Ocean, NATO Advanced Research Workshop.*

Sources: NATO Science for Peace and Security Programme, Aspen Institute, Shell International, Darmouth College, WWF Arctic.  
£44,000 (2010–2011).

*Modelling permafrost dynamics and change in the Arctic*

Source: ENI SpA  
£521,744 (2008–2012)

*Heritage Lottery Fund Stage 2 Museum Grant - Renovation of museum and archives: developing the Scott Polar Research Institute museum*

Source: Heritage Lottery Fund, Grant HG-06-01385/2  
£994,000 (2009–2011)

*Investigations into the impacts of environmental change on the glaciers and ice caps of the Arctic*

Source: ConocoPhillips  
£100,359 (2008–2011)

*Negotiating pathways to adulthood: social change and indigenous culture in four circumpolar communities (NSF ARC-0755348)*

Source: US National Science Foundation  
£67,959 (2008–2012)

*Growth and decay of Antarctic and Arctic ice sheets from marine geophysical records with particular reference to the West Antarctic Ice Sheet*

Source: Prince Albert II of Monaco Foundation  
£75,701 (2010–2012)

*Growth and decay of Antarctic and Arctic ice sheets from marine geophysical records with particular reference to the West Antarctic Ice Sheet*

Source: Isaac Newton Trust, Cambridge  
£18,101 (2010–2012)

*Antarctic Treaty Summit: Science-Policy Interactions in International Governance.*

Source: Prince Albert II of Monaco Foundation  
Euro 75,000 (2009–2011)

## Publications by Institute Staff

### Papers

**Batchelor, C.L., Dowdeswell, J.A. and Hogan, K.A.**, 2011. Late Quaternary ice flow and sediment delivery through Hinlopen Trough, northern Svalbard margin: submarine landforms and depositional fan. *Marine Geology*, v. 284, p. 13-27.

Bartholomew, I., Nienow, P., Sole, A., Mair, D., Cowton, T., **Palmer, S.** and Wadham, J., 2011. Supraglacial forcing of subglacial drainage in the ablation zone of the Greenland Ice Sheet. *Geophysical Research Letters*, v. 38, L08502, doi:10.1029/2011GL047063.

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## Chapters in Books and Other Contributions

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## Doctoral and Masters Theses

**Debusmann, M.**, M.Phil., Sealing the EU off from sealing.

**DeRydt, J.**, M.Phil., Relating surface and bed properties of Antarctic ice streams.

**Geddes-Barton, M.**, M.Phil., Channel systems and sediment plumes from Canadian Arctic ice caps: observations and modelling.

**Grey, L.**, M.Phil., Surface topography and change, Langjokull ice cap, Iceland.

**Macadam, J.**, M.Phil., The Arctic coal rush, Spitsbergen and the British imagination 1910-1920.

**Messarli, A.**, M.Phil., Identifying spatio-temporal patterns of supraglacial lake drainage and implications for the further understanding of the hydrology of the Greenland Ice Sheet.

**Rye, C.**, Ph.D., Assessing the importance of subglacial hydrology on the evolution of the Antarctic ice sheet; a numerical modelling approach.

**Tedstone, A.**, M.Phil., Sediment plumes as indicators of Greenland ice sheet runoff onset and duration.

**Thompson, D.M.**, M.Sc., The validation of British Arctic whaling information (1750-1850)

**Thompson, N.S.**, M.Phil., Iceberg scouring on the continental shelf of Greenland.

**Weisburger, A.**, M.Phil., Indigenous knowledge in international Arctic governance regimes.

## Seminars

### Polar Physical Sciences seminars, including:

Polar ozone loss  
Neil Harris (University of Cambridge)

Ocean forcing of ice-sheet change in West Antarctica  
Adrian Jenkins (British Antarctic Survey)

Imaging contemporary subglacial landscapes: detailed geophysical surveys of Antarctic ice streams  
Ed King (British Antarctic Survey)

Antarctic subglacial hydrology and topography  
Anne Le Brocq (University of Exeter)

Why do glaciers fall apart?  
Martin O'Leary (University of Michigan)

Quantifying the predictive uncertainty of numerical mass-balance models  
Cameron Rye (University of Oxford)

Microbial communities in Antarctic subglacial aquatic environments  
Mark Skidmore (Montana State University)

### Polar Social Science and Humanities seminars, including:

*On sagas and trolls in Greenland*  
Eleanor Rosamund Barraclough (Norse, Cambridge)

The inhabited Arctic: new cartographies in the study of Arctic governance and exploration  
Michael Bravo (Convenor)

Issues of historical practice in the polar region: Scott Polar History Colloquium  
Michael Bravo, Cristina Adcock and Shane McCorristine (Convenors)

*On mesmerism, spiritualism and Arctic explorers*  
Shane McCorristine (Maynooth and SPRI)

*Brasilian Antarctic scientists and their cosmologies*  
Luís Guilherme Resende de Assis (Brasilia)

The post-Fordist Arctic: new migration patterns in Canada's North  
Chris Southcott (Aix-en-Provence)

Ontological clash of afterlives: why Siberian natives can't engage with the ghosts of Russian Gulag prisoners  
Olga Ulturgasheva (SPRI)

*Resorting to sorcery: filling in for the failure of judicial redress in Siberia*  
Kostas Zorbas (University of Thrace, Greece)



# Polar Information and Historic Archives

## Library and Information Service

The Library provides services to students and academic staff from many University departments, with the majority of regular users coming from within the Institute and from the Department of Geography. In addition, the Library received almost 900 visits from external readers during the year. Library staff continued to provide induction sessions and deliver information-literacy training on demand for postgraduate students. During 2011, the Library hosted visits from, amongst others, the Rector and staff of Yakutsk University, the Captain and senior officers of *HMS Protector*, the Heritage Lottery Fund East of England team, the Art Fund regional group, students from the Arizona Center for Medieval and Renaissance Studies, librarianship students from University College London, the Cambridge graduate library trainees, the Cambridge Library Group and the Cambridge Visiting Scholars group. From April to June, students from West Suffolk College used the Library's resources as part of a joint education and outreach project on nutrition and metabolism. The Librarian again provided tours during the Alumni Weekend and the Open Cambridge weekend, all of which were fully booked. Library and archival material relating to Captain Scott and to the history of glaciology was filmed by the BBC and ITV, as well as by a number of independent production companies.

A total of 2324 monographic items was added to the library during the year. The SPRILIB web catalogue (Antarctica, Ice and Snow and Russian North) was also updated to include material published up to the end of 2011. Polar and Glaciological Abstracts was published in-house with three issues produced during the year. Records were sent for two updates of the Arctic and Antarctic Regions CD-ROM published by the National Information Services Corporation. Working in co-operation with the World Data Centre for Glaciology, records of items relating to the current International Polar Year were submitted quarterly to the IPY Publications Database, <http://www.nisc.com/ipy>. Input continued to the Antarctic Bibliography, searchable free of charge on the web at <http://www.coldregions.org/dbtw-wpd/antinfo.htm>. In July, The Librarian, Archivist and Picture Librarian visited Michael Swales to discuss the deposit of the Tristan da Cunha archive in the SPRI collections. During the Michaelmas Term, the Librarian and her Assistant, Rebecca Stancombe, worked with staff from Cambridge

University Press to select titles suitable for reproduction in facsimile in CUP's Cambridge Library Collection.

In addition to research grants received for specific projects, the Institute received, during the financial year, sums for the general support of information and library services. Thanks are due to several supporting bodies.

Ministry of Defence grant in aid (DC-ICSP)	£35,000
Royal Society grant-in-aid (for WDCGC)	£11,000
FCO Polar Regions Unit	£10,000

Heather Lane continued to represent the Institute on the Journals Coordination Scheme Consultative Committee for the School of Physical Sciences and on the Departmental and Faculty Librarians' Group. She was elected to the newly formed Cambridge Libraries Advisory Group, which replaced the General Board Committee on Libraries. She represented the Institute at meetings of the Antarctica 100 committee and at the British Antarctic Territories stakeholders meeting, as well as continuing as a member of the Joint Museums Committee and the Cambridge Museums Steering Group. Georgina Cronin began a postgraduate qualification in Information and Library Management by distance learning from Northumbria University which has been supported in part by the Institute's B.B. Roberts Fund. She also trained as a First Aider with St John Ambulance. Suzan Griffiths provided occasional cover in the Library Office for staff on leave.

Our volunteers assist the staff to research and maintain the Library's collections. Their efforts are critical in helping the library to provide research support. We were saddened by the sudden death of Maria Shorthouse, who had worked tirelessly to maintain our collections of press cuttings over the past few years. Percy Hammond and Jean Cruttwell continued their excellent work with the map collection and John Reid applied his research expertise to a number of complex enquiries. Janey Huber continued to work a new bibliography of the French peri-Antarctic islands and was joined by Niamh O'Mahony, whose Russian language skills are a great advantage. The Library also offered work placements to William Wright and Thomas Sherwin from the Perse School.

**Heather Lane**

## World Data Centre for Glaciology, Cambridge (WDCGC)

The WDCGC manager acquires and catalogues glaciological material for the SPRI Library, supplies material to the WDCGC website and maintains the online Directory of European Glaciology. WDCGC also responds to requests for glaciological information from academic and media researchers and the general public, either directly or by referral. The expertise of the Data Centre Manager as a glaciologist is also invaluable in enabling the Library to answer the wide range of questions received from the polar community and the general public. The WDC is in recipient of up to 2000 enquiries a year. The WDCGC played a key role, during the International Polar Year (IPY) 2007-

2008, as a major component of SPRI's involvement in the International Polar Year Publications Database (IPY-PD) consortium. As part of this initiative, the WDC is committed to capturing, abstracting and indexing the published output of IPY research into glaciology worldwide, as well as any associated education, outreach and communications materials, not just for the duration of the Polar Year, but for the fifteen years which follow. The IPY Publications Database will make a significant contribution to achieving the legacy targets of the IPY.

**Rick Frolich and Heather Lane**

## Picture Library

The activities of the Picture Library over the last year have been dominated by the centenary of Captain Scott's British Antarctic Expedition, 1910-13, whilst continuing to assist many visitors and enquirers from around the world with their research of photographic material for use in a variety of publications, television programmes, lectures, museum exhibitions and theatre productions.

Photographic material has been supplied for a number of exhibitions including those at the Australian National Maritime Museum, the Fram Museum, Norway, Gilbert White's House and Garden and The Oates Collection, the Kidwell Industrial Museum, the National Maritime Museum Cornwall, the National Museum of Wales, the Natural History Museum in London, Northampton Museum and Art Gallery, and Plymouth City Museum and Art Gallery. A significant number of images has been supplied to accompany orchestral and theatre performances, including the Scott Centenary concert tour of the London Sinfonia Orchestra and productions of the play 'Terra Nova' by Ted Tally for the London Academy of Music and Dramatic Art (LAMDA) and Bawds at the ADC Theatre in Cambridge.

Our polar images have been published in many publications from travel catalogues to scientific journals, including *Scientific American*, *Current Biology*, *Nature*, *National Geographic* and in course material for the Open University. Images have also been supplied for a number of books including: 'Captain Scott's Invaluable Assistant, Edgar Evans' by Isobel Williams; 'Birdie Bowers: Captain Scott's Marvel' by Anne Strathie; a special promotional catalogue for Nigel Cabourn Ltd. Clothing; and re-prints of Captain Scott's journal, 'Scott's Last Expedition' by Wordsworth Editions Ltd. and Vintage Classics. Images have also been supplied for the book 'The Quest for Frank Wild' by Angie Butler.

In addition to numerous BBC news items, images have been supplied for a variety of television programmes including: 'Flog It' (BBC 2); 'Antiques Road Trip' (BBC 2); 'The Last Explorers', a documentary about the journey made by William Spiers Bruce to Antarctica (BBC 2); 'The Secret Life of Ice' (BBC 4); 'The making of David Attenborough's Bachelor King' (Sky One); 'Shackleton's Whisky' (National Geographic); and 'On the trail of Tom Crean' (Redshank Ltd, Ireland).

*Captain Scott's hut at Cape Evans, McMurdo Sound, Antarctica*





The Picture Library was also pleased to provide an image for a Royal Mail postage stamp. The photograph of Captain Scott and his four companions at the South Pole is one of four stamps commemorating significant attainments during the reign of the Monarchs of the House of Windsor including our present Queen Elizabeth II. The stamp is part of the House of Windsor and Saxe-Coburg-Gotha, Kings and Queens stamp set.

The Picture Library acquired, by generous donation from Dr Peter Pritchard, an interesting group of photographs from the Cambridge Spitsbergen Expedition 1938. In addition, we received, on a loan

basis from Mr Robert Mack, a significant album of photographs taken on Shackleton's *Nimrod* expedition 1907-09. These are welcome additions to the collection and will compliment material the Institute already holds from these expeditions.

The Picture Library Manager has been invited to join the new Management Committee for the Cambridge University Collection of Aerial Photography (CUCAP) in an advisory and supporting role. The Picture Library would also like to acknowledge the invaluable help given by Angela Haines for her dedicated voluntary work throughout the year.

**Lucy Martin**

## The Thomas H Manning Polar Archives

This year has seen several anniversaries, each of which has allowed the archive collections to reach a wider audience. The year started with the 75th Anniversary of the British Graham Land Expedition, 1934-37, and it was a pleasure to welcome descendants to the reading room to look through the papers we hold for this expedition. In September we celebrated the centenary of Edward Whymper, whose papers, including his alpine and Greenland diaries, we hold.

The centenary celebrations for the *Terra Nova* Expedition, 1910-13, have provided an opportunity to showcase some of the treasures of the Archives through the "These Rough Notes" museum exhibition. Diaries, letters, reports and maps all help to tell the story of the expedition from the first public appeal for funds through to the public lecture given by Teddy Evans at the Queen's Hall after the return to Britain.

Away from the Institute, archive material including letters from *Terra Nova* chief Stoker William Lashly, telegrams from Sir Ernest Shackleton, and an Inuit

vocabulary notebook by Arctic explorer George Back, were loaned to the National Maritime Museum in Cornwall. Charles Wright's ice notes, which were on display in Australia, have returned ready for their inclusion at the Natural History Museum's forthcoming *Terra Nova* exhibition where they will be joined by one of Captain Scott's last letters and reproductions of some of the maps from our collections. One of the treasures from the archives, the South Pole journal of Henry Bowers, was prepared for publication; thanks are due to Louise Watling and Alison Jolly for their work on the text.

Over 500 half-day archive bookings were made by researchers during 2011, and more than 1,700 documents were requested. The Archive volunteers - Sally Stonehouse, Deirdre Hanna and Michael Laughton - have provided invaluable assistance. This year they were joined by two work-placement students over the summer; Tom Sherwin and William Wright. Lynn Russell also assisted with a transcription project.

**Naomi Boneham**

## Polar Record

The journal continues as an internationally refereed publication of polar research in the sciences, social sciences and humanities. Four issues of *Polar Record* were published by Cambridge University Press during 2011. Twenty-five articles appeared during the year together with 12 notes, 20 book reviews and other contributions, including three obituaries. The practice of issuing reprints has now ceased and authors receive a final pdf that they are at liberty to copy. All accepted papers are published on the journal website before appearing in hard copy form. The aim is that, if a paper be approved by referees, 'publication' should be no later than eight weeks after submission. This makes *Polar Record* attractive to those authors for whom priority is important and partly explains why

the Editor had sufficient material for the whole of the print run for 2012 and for the first half of 2013, well before the end of 2011. A further factor stimulating the increasing number of submissions for publication appears to be the journal's ISI status, received in 2006. This seems to have had a considerable influence on the journal's 'impact factor'. On the basis of statistics supplied by Cambridge University Press, the impact factor has improved from 0.37 in 2006 to 0.89 in 2010. It is a pleasant duty to report that no fewer than 67 referees were consulted during the year and, for their input towards making the journal a success, the Editor and Institute are most grateful.

**Ian R. Stone (Editor)**

## SPRI Website

Much of this year's activity has been taken up with preparation for the new Museum website to be launched in 2012, and some initial work on the upcoming upgrade of the library catalogue. A new 'SPRI in the News' section of the site charts daily coverage

of the Institute in the media. Various sections of the site have been refreshed, and there have been ongoing improvements to the online catalogues.

**Martin Lucas-Smith**

# Teaching, Learning and Understanding

## University Teaching

Academic members of the Institute's staff coordinate and deliver undergraduate lecture courses, and run laboratory classes, in the departments of Geography, Physics and Social Anthropology. Undergraduate supervisions are also provided to students in many colleges. Members of our staff are Fellows of Christ's, Downing, Jesus, Murray Edwards, St. Catharine's and St. John's colleges. Our M.Phil. course in Polar Studies has academic strands in Physical Sciences and in Social Science and Humanities, and staff also contribute to

other M.Phil. programmes taught in the Department of Geography and to Part III of the Natural Sciences Tripos. We have twenty or so doctoral students, registered to study topics which range from the past and present flow of glaciers and ice sheets to the nature of Inuit society in the Arctic. Each student is nested within one of our research groups, providing a strong and integrated research culture.

**Julian Dowdeswell**

## The Polar Museum

Following the major refurbishment and re-opening of the Polar Museum, 2011 was a year of consolidation and achievement. After the museum was included in the long-list of ten nominations for the Art Fund Prize for Museum of the Year in late 2010, we were pleased to be on the shortlist of four museums that went through to the final, although we were disappointed to miss out on the award, which went to the British Museum.

Visitor numbers have continued to grow and we welcomed almost 50,000 visitors to the new displays and exhibitions during 2011. Visitor satisfaction, monitored using questionnaires, is very high and feedback indicates that visitors enjoy their experience. The major project over the summer months was the refurbishment of the last of the museum's stores. This has been upgraded to the same level as the main basement storage areas and houses the museum's collection of larger objects including an important collection of polar sledges.

The museum mounted four temporary exhibitions during the year. The first, *Return to Antarctica: the British Graham Land Expedition, 1934–37* was curated by Bryan Lintott and ran from 20 January to 30 April. To accompany the exhibition, we published another in our series of *Polar Profiles*, written by Bryan. The opening, in January, included a group of descendants of the expedition members, especially Peter Rymill and his family from Australia and the Bertram family, who had done so much to make the gathering a success. A celebratory dinner was held in St John's College.

The exhibition, *Sewing our traditions: Dolls of Canada's North* (18 May to 20 August) featured dolls made by the native peoples of northern Canada and was loaned by the Yukon Arts Centre. The exhibition was generously sponsored by the Nunavut, Northwest Territories and Yukon governments. The Nunavut Arts and Crafts Association also brought a group of the dollmakers to the museum in May to demonstrate craft skills and doll making in the museum. In the autumn (7 September to 19 November), the museum

mounted what is thought to be the first exhibition in the UK to commemorate the life and achievements of Roald Amundsen. Through the generosity of the Director and Trustees of the Fram Museum, many objects owned by or related to Amundsen were exhibited. In December, staff of the Polar Museum participated in the Norwegian centenary celebrations of Amundsen's achievement of the South Pole in 1911. The final exhibition of the year, *These Rough Notes: Capt. Scott's Last Expedition* (6 December to 5 May 2012) commemorated the *Terra Nova* expedition and was an opportunity to display the wealth of archive material relating to the expedition held in the Institute; many of the manuscripts have never been exhibited before. To coincide with the exhibition, the museum published another of its *Polar Profiles* series on the expedition, written by Beau Riffenburgh.

The Institute's Education and Outreach Officer, Katherine (Suzy) Antoniwi left early in the year for a new post at the Science Museum, but we welcomed Sophie Weeks as her replacement in May. Our Conservator, Fiona Cahill also departed for a new post in New Zealand, having done much to establish the conservation policy and procedures which have enabled us to achieve accredited museum status, as well as conserving almost every item in the permanent displays. We are grateful to the UK Antarctic Heritage Trust for their continuing support, which has enabled us to recruit her replacement. The Keeper and Documentation Assistant, Willow Silvani, took part in a regional discussion on rationalisation of the collections, in line with a new national policy. With a grant from the Effective Museums programme, a pilot project began in 2011 and, with extensive help from volunteer Daisy Courtauld, will continue into 2012 to identify and locate the provenance information for objects lacking catalogue descriptions.

Acquisitions during the year included a number of gifts and purchases. Jennifer Heal donated a wooden box containing a set of furs (boots, trousers and anorak); a beaded anorak; a number of wooden artefacts and three volumes of the Greenland Survey.



Jennifer's mother, Elizabeth Mary Wager, overwintered in 1935–36 with the British East Greenland Expedition based in Kangerdlugssuaq. She was married to Harold Wager, botanist on the expedition led by his brother Lawrence. She and Lawrence's wife, Phyl, were the only two women on the expedition. Christopher Courtauld kindly donated a harpoon with throwing board which had been collected in the field in East Greenland 1926–35 by his father, Augustine Courtauld, and six medals, four from WWI and the Coronation Medal (High Sheriff of Essex) 1953 and Polar Medal with Arctic 1930–31 bar.

Purchases included a wooden box containing a knife and spoon with a hand carved depiction of *Terra Nova* on the lid and with the ship's cap band pinned inside, taken by Edward McKenzie on the British Antarctic Expedition 1910–13. McKenzie's aluminium compass, which he took with him to the Antarctic, and a medallion stamped with the device of Scott's Expedition with loop on silver chain, was also purchased. Two watercolours were also bought, of the *Terra Nova* at McMurdo Sound, painted by McKenzie during the voyage on the British Antarctic Expedition 1910–13; one showing various animals while the other bears the title, 'Antarctica, *Terra Nova* & *Fram* meet at the Great Ice Barrier'. Also bought at auction were a sugar bowl and saucer with the printed crest of the British Antarctic Expedition 1910–13 and *Terra Nova* RYS which belonged to Frederick Parsons, Petty Officer on *Terra Nova*.

The Museum lent material for display to a number of institutions, including the National Maritime Museum Cornwall for the exhibition *On Thin Ice: Pioneers of Polar Exploration*, jointly organised by the Polar Museum and our hosts in Falmouth. Material was again lent to the American Museum of Natural History for their touring exhibition, *Race to the End of the Earth*, held at the Palazzo Fondazione per la Cultura Ducale in Genoa. A pullover belonging to George Murray Levick was loaned to the Fairlynch Museum in Devon. The touring exhibition, *The Antarctic Photographs of Herbert Ponting*, was loaned to Braintree District Museum.

Staff spent some time in transcribing and editing Henry Bowers' polar journals and letters for publication in a deluxe edition early in 2012. In addition, many members of the Institute were involved in recording segments on a range of topics for inclusion in the new audio guide to the museum which was launched in October.

The museum benefits greatly from the help and enthusiasm of its volunteers. Thanks go especially to the group of museum volunteers, more than 50 in number, who staff the museum during opening hours, meeting and greeting visitors and looking after the shop. This team is ably organised by Kate Gilbert and looked after by our volunteer manager, Grant Rabey.

**Heather Lane**

*A young artist holds up his model of Antarctica during Cool Club activities at the Institute*



## Education and Outreach

Over 6000 people participated in learning activities at the Polar Museum during 2011. Over 2600 children and young people participated in learning workshops covering topics ranging from famous people and the history of exploration to climate change and Arctic cultures. In addition, almost 1200 adults visited for formal tours of the museum, and over 2500 adults, children and young people participated in informal activities coordinated by the University Museums, such as the Science Festival, Festival of Ideas, Twilight, Summer in the Museum and other open days. The learning-programme activities reflected a new approach to education and public engagement at SPRI, exploring the three distinct but overlapping topics of Polar Exploration and Heritage, Arctic Cultures and Polar Science. Highlights of the year included meeting Inuit doll-makers from Northern Canada, a symposium gathering international experts to discuss aspects of the lives of Scott and

Amundsen to begin our Scott Centenary programme, and a family day meeting Greenlandic and Canadian Eskimo Huskies and learning more about their role in the history of polar exploration through objects in the museum and directly from the polar explorers themselves.

In Summer 2011, we introduced The Cool Club, a programme of holiday activities where children aged 7 to 11 came face to face with seven different polar scientists to learn more about their research through tailor-made 'hands-on' experiments and activities. All 84 places on offer were filled, and the club developed a loyal following of children and parents. SPRI research student, Allen Pope took a poster on the subject of The Cool Club to the Fall meeting of the American Geophysical Union, generating new international relationships with other educators at centres of excellence in the field.

**Sophie Weeks**

## Projecting the Significance of the Polar Regions

Institute staff continue to be involved in the outward projection of polar research and education through, for example, media work, public lectures and visits by schools to our polar museum. A number of our staff made appearances on radio and television, including BBC and ITV news programmes. The amount of filming taking place in the Institute has increased markedly this year, related to strong media interest in the *Terra Nova* Centenary.

Views and quotations on polar topics, many of which include an emphasis on polar environmental change issues, have also appeared in broadsheet newspapers at home and abroad, and on the increasingly visited websites of media organisations.

Notable coverage for several of our glaciologists was related to the debate on the ice extent in Greenland linked to the publication of the new edition of the *Times Atlas of the World*. Several staff have given external talks at primary and secondary schools, in addition to academic seminars at British and foreign universities. Our regular series of Saturday evening Public Lectures, organized by Celene Pickard on behalf of the Friends of SPRI, also attracts audiences of up to 100. These external activities are time consuming, but are important in ensuring that the work of the Institute, in terms of both its scholarship and heritage activities, are projected as widely as possible.

**Julian Dowdeswell**

## Expedition Support: Gino Watkins Memorial Fund

The Fund, under the joint trusteeship of the University of Cambridge and the Royal Geographical Society, provides grants towards expeditions that meet its objectives of guiding and inspiring enterprising people towards scientific research and exploration in the polar regions. The Committee of Managers of the Fund would like to thank the Augustine Courtauld Trust for their generous contribution of £9,000. The members of the Committee who served during the year were Mr. D. Fordham (Chair), Dr. P. Adams, Dr. I. Campbell, Mr. R. Crabtree, Dr. L. Craig, Professor J.A. Dowdeswell, Dr. D. Goodman, Dr. M. Humphreys, Professor M. Lea, Mr. J. Muston, Professor R.C. Schroter and Dr. M. Tinsley.

The Committee made the following awards for 2011, from the Gino Watkins Fund and the Arctic Club:

Expedition	Award
Irish-Scottish East Greenland Expedition 2011	£2,000
Climate and biogeography from deep-sea corals in Drake Passage	£650
British Geikie Plateau Expedition	£2,000
Imperial College, Svalbard 2011	£2,500
Willing the Dragonfly	£1,000
Anglo Danish Arctic Challenge 2011	£2,000



# External Contributions to Polar Activities

## National and International Roles of Staff

Members of the Institute are active in many roles relating to national and international committees and advisory groups involving the polar regions, and are members of the editorial boards of a number of international journals. These include:

- Head of the Glaciers and Ice Sheets Division of the IUGG International Association of Cryospheric Sciences (IACS); J.A. Dowdeswell
- Member of the UK Antarctic Place-Names Committee; J.A. Dowdeswell
- Member of the International Arctic Social Sciences Association (IASSA) International Polar Year Taskforce; M. Bravo
- UK representative on the International Arctic Science Committee (IASC) Working Group on the Cryosphere; J.A. Dowdeswell
- Member of the NERC National Capability Action Group (NCAG); J.A. Dowdeswell
- Vice-President, Geological Society of London; C.P. Summerhayes
- Treasurer, International Glaciological Society; I.C. Willis
- UK Delegate to the International Science Initiative for the Russian Arctic; W.G. Rees
- Member of the international steering group for the Tundra-Taiga Initiative; W.G. Rees
- Chair of Scientific Committee, BOREAS Programme of Arctic Humanities and Social Science Research, European Science Foundation; P. Vitebsky
- Chair of Scientific Committee, Forward Look on Religion and Belief Systems, European Science Foundation; P. Vitebsky
- Permanent UK representative of the Association of Marine Mammal Hunters of Chukotka; P. Vitebsky
- Trustee: Sutasoma Trust - P. Vitebsky; Fuchs Foundation – J.A. Dowdeswell
- Chair, Polar Libraries Colloquy; H.E. Lane
- Editorial Board members: *Polar Record*, *Transactions of the Royal Society of Edinburgh*, *Archaeology*, *Ethnology and Anthropology of Eurasia*, *Anthropology and Archeology of Eurasia*, *Earth's Cryosphere*, *Cultural Geographies*, *Worldviews: Environment, Culture, Religion*.

## International Glaciological Society (IGS)

The IGS is based at SPRI. Its aim is to serve the worldwide community of glaciologists by publishing activities, organization of symposia and actively promoting the exchange of information and ideas on all aspects of snow and ice. 2011 saw another record number of paper submissions to the *Journal of Glaciology*. This is the sixth year in a row we have broken the previous year's record. In total, 198 submissions were received. The average time between submission and publication remains well within a year. During 2011, the IGS published six issues of the *Journal of Glaciology*, three issues of ICE, its news bulletin, and three issues of the *Annals*

of *Glaciology*. The *Annals* is now integrated with the Science Citations Index from volume 50 onwards; the associated impact factor should appear in June 2012. The IGS organized one international symposium in 2011, on 'Interactions of Ice Sheets and Glaciers with the Ocean', held in La Jolla, California, USA, in June. In addition, the Society also co-sponsored several IGS branch meetings and other meetings by separate organizations. Details about the IGS and its activities are available from its website ([www.igsoc.org](http://www.igsoc.org)), hosted by the SPRI.

**Magnús Már Magnússon (Secretary General)**

*Tabular iceberg offshore of the Antarctic Peninsula*



## Scientific Committee on Antarctic Research (SCAR)

SCAR provides objective and authoritative scientific advice to the Antarctic Treaty and other bodies, and brings emerging issues concerning Antarctica and its surrounding seas to the attention of policy makers. SCAR is now implementing its Strategic Plan 2011-2016, entitled "Antarctic Science and Policy Advice in a Changing World" (<http://www.scar.org/strategicplan2011/>). It is also planning for its next generation of Scientific Research Programmes (SRPs). Five new proposals will be submitted for approval (to join the current SRP Astronomy and Astrophysics from Antarctica): State of the Antarctic Ecosystem (AntEco); Antarctic Thresholds - Ecosystem Resilience and Adaptation (Ant-ERA); Antarctic Climate Change in the 21st Century (AntClim21); Solid Earth Response and Cryosphere Evolution (SERCE); and Past Antarctic Ice Sheet Dynamics (PAIS).

During 2011, SCAR continued to work on its commitment to produce annual updates of the Antarctic Climate Change and the Environment (ACCE) for the Antarctic Treaty Parties and other policy makers. Other papers on subjects such as non-

native species, subglacial aquatic environments and Antarctic Climate Evolution were also presented. The Science and Implementation plan for the Southern Ocean Observing System (SOOS) was finalised and a Secretariat office established in Hobart, Australia. This will be a major international activity over the coming years.

Concerning SCAR administration, Eoghan Griffin joined the SCAR Secretariat on a part-time basis for one year. Eoghan is responsible for producing a Climate Communications plan and for the SCAR Open Science Conference abstract submission system. Rosie Amos was also hired as a consultant to work on the redesign of the SCAR website. Looking forward, the next SCAR Open Science Conference, Business and Delgates' meetings will be held in Portland, Oregon in July, 2012. Finally, Dr José Xavier was awarded the 2011 Martha T. Muse Prize for Science and Policy in Antarctica, a \$100,000 unrestricted prize sponsored by the Tinker Foundation and coordinated by SCAR.

**Dr Mike Sparrow (Executive Director)**

## Fundraising and the SPRI Appeal

### Friends of the Scott Polar Research Institute

The year saw considerable activity by the Friends, reflecting both the usual programme of lectures and functions liberally sprinkled with extraordinary events marking the centenary of Scott's *Terra Nova* expedition. It was also the first year of office for a substantially new committee membership keen to build on the work of their predecessors in broadening the appeal of the association.

Highlights of the lecture series included talks by Angie Butler (who focused on her Quest for Frank Wild), as well as key speakers from the British Antarctic Survey. I am particularly grateful to Grattan MacGiffin, the vice chairman of the Friends, and to Dr Peter Clarkson of SPRI for so ably hosting and introducing our many speakers. Perhaps the most notable event of the year was the Scott 100 Conference, hosted by the University of Plymouth and the Royal Navy's Hydrographic and Meteorological School at *HMS Drake* in Plymouth in June. The weekend gathering of polar folk is thought to have been one of the largest in living memory with a lecture programme that drew excellent reviews. There was a traditional naval mess dinner in *HMS Drake's* wardroom with mess beatings, port, speeches and all the trimmings, recalling the *Terra Nova* Expedition's mid-summer dinner in the hut at Cape Evans in 1911.

*HMS Scott*, back in Plymouth after her second deployment to the Antarctic Peninsula, was open

to visitors. Dafnia Scott had been artist-in residence during this deployment to the Peninsula region, supported by the Friends and the Royal Navy.

Fundraising continued apace all year across a range of activities including the SSS100 Centenary Sledge-Pull, and Jennifer Murray's extreme marathoning in the mountains of Nepal, both of which continue to raise significant amounts. The new committee's influence was reflected in the Friends' Summer Lunch held, for the first time, away from Cambridge onboard Headquarters Ship *Wellington*, which is the livery hall of the Honourable Company of Master Mariners on the Thames. Attended by some 100 Friends, and guests from the James Caird Society, the UK Antarctic Heritage Trust, and the South Georgia Association, the venue proved to be very popular despite a pretty breezy and damp lunch reception on the quarterdeck. Back in Cambridge for the Friends' AGM in November, the departure from the norm this time was a black tie dinner in Emmanuel College. The Friends' activities could not happen without the support of numerous people. I am indebted to my fellow committee members and to the staff at SPRI; Ann Bean oversaw our membership, whilst Celene Pickard organised Polar Bytes (together with Heather Lane), committee meetings and the year's events.

**Nick Lambert (Chair, Friends of the Scott Polar Research Institute)**



*Unveiling ceremony in the SPRI garden for a new memorial dedicated to those who died in Antarctica  
(Nick Owens, Rod Rhys Jones, Oliver Barratt, sculptor, and the Director)*

## The SPRI Appeal

The Scott Polar Research Institute is an international centre for research into the polar regions and is also home to unrivalled resources of polar information and expertise, housing the world's largest polar library, Britain's only dedicated polar museum, and a national repository for polar archives that record some of the most memorable episodes in exploration of the Arctic and Antarctic. The Institute's Archives, Museum and Library provide members of the general public, as well as scientists, government bodies, industry and polar inhabitants with important information on a variety of polar topics, including climate change, management of natural resources and historical polar expeditions. Through both the publication of our research and by public outreach, the Institute helps to educate and inform a worldwide audience about the polar regions.

Now that the project for the redesign and refurbishment of the Institute's Polar Museum is complete, we turn to further fundraising priorities. We wish to endow academic posts, and especially a Professorship in the field of Polar Environmental Science. We are also working to underpin the future

development of the Institute's Archives and Museum. Our highest priorities in these areas are to provide permanent funding for the important posts of Institute Archivist and Polar Museum Curator. Funding for these positions has until now been supported by a series of short-term grants – an inherently unstable position. We also wish to build up endowment funds for the support of research students at the Institute (now initiated as the Scott Polar Scholarships Fund), and to enable increasingly expensive polar fieldwork to continue to take place on a regular basis.

The generosity of a number of individual donors, together with private trusts and foundations, is gratefully acknowledged. Particular thanks are due to Sir Humphry Wakefield for his continuing support of the Appeal.

**Further information on the Appeal is available from the Director, Professor Julian Dowdeswell (director@spri.cam.ac.uk; 01223-336541).**

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