The University of Oxford

Department of Earth Sciences

earth sciences news

Michaelmas 2010

issue no 01

in this issue:

UNIVERSITY OF OXFORD

Introduction by Professor Philip England Head of Department

Photo by Rob Judges

I sit down to write this letter at a poignant moment in the history of the Department. It is midnight on Friday 17th September, 2010, the last full day of our activities in the old Earth Sciences building or (as many of you will remember it) the Department of Geology and Mineralogy. On Monday morning, the movers will arrive to transport all our offices into the new building on South Parks Road. Fittingly - perhaps you will say - the last departmental activity in the old building was a party, and we expect to inaugurate the new building with beer hour in our new roof-top common room, this Friday, 24th September.

This building has been a long time coming and I confess that, as completion approached, I feared that we might feel a slight sense of anticlimax when we finally took possession. In the event, everyone has been delighted with the space that is available to us. The new building has approximately twice the floor area of our old quarters and, in addition to a splendid suite of laboratories, we have a well-organized set of teaching labs and lecture theatres, computer room, and library. Later in this newsletter you will find information on the various events that we are organizing that will allow you to visit us in our new home, and I hope very much to see you in Oxford on one of these occasions.

But this year has not only been about the new building. In October 2009 we held two celebrations that resonated over half a century of the life of the Department. In mid-October, the 50th anniversary of the first mass-spectrometry paper to come out of the Department of Geology and Mineralogy[1] was the excuse for a series of lectures and a dinner. Alumni of the Age and Isotope Group came from far and wide to hear magisterial summaries of the past, present, and future of isotopic geochemistry from Stephen Moorbath, Keith O'Nions, Alex Halliday, and Gideon Henderson. (Question: which of these scientists have surnames that cannot be read as a list of elements, using the chemical symbols as they were in 1959?)

At the end of October, we celebrated David Vincent's 90th birthday with a lunch attended by about 30 friends, whose involvement with the Department spanned 60 years. I well remember a spring day in 1972 when David met a scruffy young physics student at the door of the Department, and persuaded me that life as a geologist (supervised by Ron Oxburgh and Stephen Richardson) had a lot more to offer than cosmic-ray research. Hundreds of us have reason to thank David for his tireless efforts to maintain the unique atmosphere of intellectual excitement and intimacy that characterized the Department under his leadership.

I have no doubt that, as we settle in to our new home, all sorts of adjustment will take place, but I am sure that the same atmosphere will persist.

[1](*Isotopic composition of Lead from British mineral deposits, S. Moorbath,* ***Nature****, 183, p595-596.*)

Professor Stephen Moorbath in equilibrium at the 5.0 x 10^1 year celebration

New Earth Sciences Building

View from South Parks Road showing the narrative wall

On the 20th September 2010, the Department of Earth Sciences was handed the keys to the New Earth Sciences Building.

Our new home combines world-class teaching and research facilities, and is the flagship for Oxford University's redevelopment of its Science Area.

Providing laboratory and office space for around 400 students and staff, the purpose-built centre will enable the Department to maintain its international reputation as a centre for research excellence.

The building has been designed by Wilkinson Eyre Architects not only to meet the academic requirements of the Department, but also as a physical expression of the subjects taught and researched. The 'narrative wall' along the long west wing is clad in linear folding planes of stone: two different beds of Jura Limestone with inclusions of darker Purbeck Feather

Stafford Critchlow, Director of Wilkinson Eyre Architects: "It is a rare opportunity to express the diagram of a building's uses so clearly in its architecture and to be able to imbue the facades with a 'narrative' inspired by its users. This building, with a big sustainable agenda, will raise the profile of Earth Sciences research and its importance in Oxford and the wider world."

Senior Common Room

Central staircase

To celebrate the opening of the New Earth Sciences Building, the Department is hosting two Alumni drinks receptions to which all Alumni are invited. There will be an opportunity to have a tour of the New Building, learn about current research in the Department and catch up with old friends.

19th November: **5.30pm-8.30pm**
26th November: **5.30pm-8.30pm**

For more information please contact: Hannah Jackson, Alumni Relations Officer. *hannah.jackson@earth.ox.ac.uk*

Pictures by Morley von Sternberg.

Prizes and awards for current research in the Department

1. **Professor John Woodhouse** has been awarded the **Gold Medal for Geophysics** by the Royal Astronomical Society which, along with its equivalent for Astronomy, is the Society's highest honour.

2. **Dr Ros Rickaby** is one of this year's recipients of the **James B. Macelwave Medal,** which is awarded for significant contributions to the geophysical sciences by an outstanding young scientist.

3. **Dr Hugh Jenkyns** has been awarded the **2010 Laurence L Sloss Award** for outstanding contributions to the interdisciplinary field of sedimentary geology.
"The Sloss award is given annually to a sedimentary geologist whose lifetime achievements best exemplify those of Larry Sloss — i.e., achievements that contribute widely to the field of sedimentary geology and through service to GSA."

4. **Professor Philip England** has been awarded **The Augustus Love Medal of the European Geosciences Union** which is awarded to a distinguished scientist in the field of geodynamics, comprising mantle and core convection, tectonophysics, post-glacial rebound and earth rotation.

5. **Peter Pockley (Balliol, 1958)** has been awarded an **Academy Award** from the Australasian Academy of Science, for contributions to science by means other than the conduct of scientific research.

David Robinson (Worcester, 1997) has received the **Winton Capital Prize** from the Royal Astronomical Society. The prize is awarded for exceptionally promising early career development. The Royal Astronomical Society says of this award:

"The Winton Capital prize in geophysics is awarded to Dr David Robinson of the University of Oxford. Dr Robinson started his research career as an undergraduate, analysing a large Indian Ocean earthquake. During his PhD, he looked at the 2004 Boxing Day Sumatra earthquake that led to the tsunami, discovering a relationship between the shape of the ocean floor and the earthquake. He later analysed the 2001 Tibet earthquake, showing that it ruptured at a speed of nearly 6 km per second."

Pete Spooner (3rd Year Undergraduate at University College) has been awarded a prize in the **Lyell Essay Competition**, with his essay titled "The present is the key to the past"

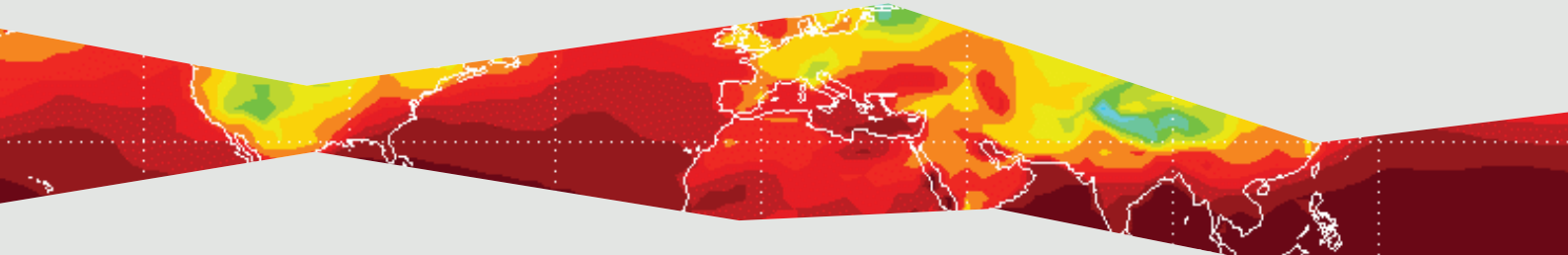
1. 

2. 

3. 

4. 

5. 



Bermuda: Oceans and Climate field trip

Staff and students, some clutching Niskin bottles, set out on a small research boat to sample the enclosed and sometimes anoxic basin of Harrington Sound during the first Oceans and Climate field trip.

September saw the Department's first Oceans and Climate field trip – to the sunny island of Bermuda. From the viewpoint of land-locked and autumnal Oxford, Bermuda is the perfect place to study physical, biological and chemical oceanography. It sits in the northward flowing Gulf Stream, while in the deep ocean, the key water mass – North Atlantic Deep Water – slides past in the opposite direction. Bermuda has rich and varied ecosystems that cannot be seen closer to home, including coral reefs and those of the true open-ocean (the research focus of the trip leader – Dr. Heather Bouman). And the Island features an enclosed basin where waters become low in dissolved oxygen, providing a natural chemical laboratory.

On land, Bermuda also offers fantastic opportunities for field-study of climate change. The rocks are an alternating sequence of dunes and soils – clearly showing the impact of changing climate and sea-level through time – and there are some beautiful caves where stalagmites have recorded the history of climate for tens of thousands of years. Dr. Hugh Jenkyns led this geological portion of the trip – returning to outcrops last visited nearly 40 years previously, to find many of them unchanged!

The Bermuda Institute of Ocean Sciences provided all the infrastructure for the trip, including a two-day trip on their ocean-going research ship – the R/V HSBC Atlantic Explorer. This trip provided 12 fourth-year undergraduates their first experience of science at sea – working with the sampling bottles and devices for measuring temperature and salinity that are critical tools for oceanographers (and testing their sometimes wobbly sea-legs).

The trip was made possible through very generous support from Arch Re. Arch Re also hosted an evening function at which Prof. Gideon Henderson talked to a group of insurance professionals on increasing 21st Century risk due to sea-level change, and Oxford students mingled with industry professionals. Preston Hutchings; Hector Suazo, and Nicolas Papadopoulo are particularly thanked for their help in setting up the relationship with Arch Re. Their support enabled a hugely successful trip that was truly inspirational for a cohort of Oxford students.

The Department is delighted to announce the recipients of this year's Undergraduate Prizes

Palaeontological Association Prize for the best 3/4th year performance in Palaeontology– John Stanfield

Mineralogical Society Prize for the best 3rd year performance in mineralogy – James Coussens

Keith Cox Prize for the best second year mapping exercise (Assynt) – Emma Nicholson

Gibbs Prize for the best FHS mapping report – William Hutchison

Shell Prize for the best 3rd year geochemistry student – Emily Richey

AWE Prize in Geophysics – Luke Sheldon

Schlumberger Prize for Best Performance in Geophysics – Amy Gilligan

BP Prize for the best fourth year project – Sophie Lawrence

Shell Prize for the best overall performance in fourth year FHS – Stefan Lachowycz

Burdett Coutts Prize for best overall performance in FHS – Luke Sheldon

CIWEM Young member of the year

by Elizabeth Guilford (Exeter, 2000)

Elizabeth receiving her CIWEM award from Lord Smith, Chairman of the Environment Agency

After graduating from Oxford in 2004, I went on to study for a Masters in Hydrogeology at the University of Birmingham. It was during the Christmas vacation of my Masters that an earthquake of magnitude approximately 9.3 struck off the west coast of the Indonesian island of Sumatra, triggering a devastating tsunami. Following the news coverage, I could see how the skills that I was developing could be essential to the redevelopment of the areas affected and just wanted to go and help. Little did I know that two years later my employer, Mott MacDonald, would post me to Aceh, the worst hit region of Sumatra. I spent a very interesting ten months, from August 2007 to June 2008, based in Aceh's main city, Banda Aceh, working on the American Red Cross Tsunami Recovery Programme. My team was responsible for the design of permanent water supply systems for approximately 46 rural communities.

Aceh is a beautiful place, home to dramatic scenery, coral reefs, Sumatran tigers and elephants, amongst other things that I didn't get a chance to see. It is, however, also a place that has seen many troubles. The need for a united effort in the tsunami recovery brought a peace agreement in 2006 to end 30 years of internal conflict. This included the designation of Aceh as a semi-autonomous state and introduction a stricter form of Islamic Sharia Law. After nearly five years, the recovery of Aceh is almost complete but it has been a slow, difficult process.

My role as a hydrogeologist involved assessing the limited geological, hydrogeological and hydrochemical data and using this combined with information gathered from site visits to determine the water source most likely to provide a sustainable water supply for each community. I worked alongside engineers and social specialists from many different organisations and nationalities, ensuring that the communities played a major role in every step of the process so that they could take ownership of the end result.

This process revealed some interesting challenges. The infrastructure was in a state of disrepair as a result of years of neglect during the conflict followed by the tsunami, which destroyed most of what remained. The west coast of Aceh also had the forces of tectonics to contend with. The earthquake caused approximately one metre of subsidence and the loss of large areas of coastal land to swamp, leaving some communities with nothing, not even the land they used to own.

The rapid turnover of staff and organisations created difficulties in communication, such as that which caused one community to lose its water supply because a new road destroyed their spring. Finding a new source involved site visits to areas which required four hours in a 4x4 vehicle on partially asphalted roads and rickety ferries, continuous checking for leeches and fighting off dengue-fever and malaria bearing mosquitoes. On a couple of visits we received messages from villagers saying that we couldn't go into the jungle because a family of tigers

Elizabeth holding a baby from one of the communities

Left: Elizabeth with the Norwegian Red Cross geologists and drillers

Below: Swamp and sea where Lhok Kruet village used to be

had just moved into the area and that we should be careful because an elephant slipped there last month. Not my usual everyday challenges!

Working in tropical heat and humidity with very little air conditioning, spending most of my time working on my own with Indonesian Muslim men and not having much of a life outside of work created personal challenges for me. However, this was an amazing experience and gave me the opportunity to apply and develop my skills as a hydrogeologist in a completely new situation. I loved being immersed in a new culture and even taught myself quite a bit of Indonesian and Acehnese, which made life much more entertaining for all concerned!

Since returning to England, working as a hydrogeologist for Mott MacDonald has used my skills in very different contexts. I have spent most of the last 18 months working as the hydrogeologist for Norfolk County Council's closed landfill team, ensuring that the landfill sites are not contributing to groundwater contamination. Other jobs have included work for water companies looking at the impact of public water supply abstractions on surface water flows in nature reserves around Cambridge. I continue to keep in touch with the people in Aceh, providing some guidance on groundwater aspects of the work and hope that I may have an opportunity to return and see the progress for myself in the future. I have been awarded the title of Chartered Institute of Water and Environmental Management (CIWEM) Young Member of the Year 2009 and Highly Commended British Expertise International Young Consultant of the Year 2009 for my work in Aceh.

How many field trips does it take to make a geologist?

by Jack Mathews
4th year Undergraduate
at St. Peter's College

2nd year undergraduates at Lone Bothy, beneath Mount Arkle on the Assynt Field Trip

I was once told by one of the professors in the department that a geologist is only as good as the number of rocks they have looked at. From my prelim results, I obviously hadn't looked at enough rocks! However, through the department's field trip program, I have had the opportunity to see and learn about a wide selection of rocks from varied geological settings across Europe.

Within weeks of starting in Oxford we went to Pembrokeshire, learning how to take strike and dip measurements in the rains of Wales. This was essential, not only to get everyone on an even playing field (I hadn't done A-Level Geology) but also to give us an opportunity to get to know each other and form the close knit year group that makes us the envy of other departments at Oxford.

Since then we've been to Assynt in Scotland looking at the Lewisian as well as the overlying Cambro-Ordovician sequence (very handy for my mapping project in Skye). The start of second year brought the Dorset field trip; full of ammonites, the links between sedimentation and tectonics, and Hugh Jenkyns.

As someone who learns a lot better in the field than in the lecture theatre, one of the most useful field trips has been to the Mendips. I found I never did fully understand refraction seismic profiles until I had laid out a geophone array, set off an explosive charge, and watched the refraction profile data role in. And the Somerset cider is not too bad either!

The field trip to Castellane in Southern France was one of the most memorable, preparing us for our individual mapping projects at the end of our second year. In the process, we also learned about the Palaeozoic to recent geological evolution of this part of Europe. The big third year trip was to Greece. This was an opportunity to see the effects of active tectonics on mainland Greece, as well as studying all things volcanic on Santorini. Having the chance to stand on a volcano, watching the sulphurous gases escape from vents and look back over to the caldera wall was something that I certainly didn't think I would be doing when I first decided to study geology, and has definitely enriched my education, building upon the work in the lecture theatre in Oxford.

As someone who is doing a Masters project with lots of field work, and hoping to continue this at postgraduate level, the training which I have received through the undergraduate field courses has proved invaluable, giving me the grounding and fundamental knowledge in geology to allow me to follow my interests. However, I still think there are a few more rocks to see before I'm a good geologist!

John in subfusc in his 1976 graduation photo

Responsibility rocks! by John Thompson (Keble, 1973)

Since leaving Oxford with a degree in geology, my career has taken some interesting and unexpected twists. I pursued graduate degrees, worked in mineral exploration in many parts of the world, developed a university-based research group focused on the origin of mineral deposits, and most recently moved into "technology" – not information technology, but a wide variety of geological and engineering process technologies applied to mining and the environment. I am fascinated by three challenges – understanding why geological processes concentrate metals and minerals in specific locations in the crust at concentrations two to four or more orders of magnitude greater than their natural abundance; predicting the location and discovering these concentrations of metals; and determining how to mine minerals and use the products in a manner that meets societies' needs without negatively impacting people, communities or the world in general.

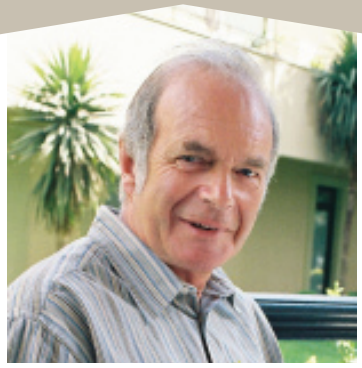
John enjoying one of his favorite British haunts – any guesses on the rock type (also a favourite) and the closest distillery?

I work for a large Canadian mining company, Teck Resources, which produces several commodities from mines in four different countries in North and South America, and explores in at least six other countries on five continents. Teck is actively pursuing strategies that are consistent with sustainability – engaging communities and building positive legacies, pursuing more efficient ways to mine and process ore, seeking ways to minimize our environmental footprint, and supporting the long term stewardship of our products. In my current role, I have been involved in new recycling technologies, new and improved water treatment including desalination, and renewable energy – wind, solar and the use of biomass, all a far cry from traditional geology but not completely removed from much of my education and training.

One of Teck's recent successes with recycling comes from our smelter-refinery complex at Trail in southeastern British Columbia. The facility has had a long history of producing zinc, lead and numerous other metals – silver, gold, indium, gallium, and germanium to name a few. The plant has been recycling lead from car batteries for over 25 years, and recently part of the facility was modified to allow the safe treatment of e-waste – computers, cell phones, TVs, fax machines etc., and recovery of the contained metals. This is already one the largest facilities of its type in North America and the goal in 2010 is to treat 11,500 tonnes of e-waste which would otherwise be destined for landfills.

The world's population continues to grow as do the numbers of people who lack even basic needs. Natural resources, metals and minerals are fundamental for healthy living even at only modest standards. We need to find new sources of critical commodities, produce and distribute them as cleanly and efficiently as possible, and then seek to capture used products and maximize recycling. Companies like Teck will play a critical role if they can align an appropriate mix of success, profit and responsibility. I have always believed that earth scientists are particularly suited to deal with many of today's challenges due to their breadth of knowledge, qualitative and quantitative skills, and appreciation of scale and time. Oxford students in earth science are educated in fundamental geo-principles from the field to the laboratory, and from global to local and microscopic scales. Amongst other things, Oxford graduates should be ideally suited to take on the challenges related to resources – discovery, recovery, use and recycling.

Alumni news



We are delighted to report that Dr Bryan Lovell (New, 1960) has been elected President of the Geological Society of London.

Dr Bryan Lovell, OBE, C.Geol., studied for both his BA and MSc at Oxford University in the early '60s. Bryan is quick to praise Harold Reading for being instrumental in his early research years, and under his 'amazing supervision', Bryan mapped a three-mile section of the North Cornish coast from Bude to Weymouth. After Oxford, Bryan spent some time in the USA, and as well as being a Teaching Fellow, he completed his PhD at Harvard University in 1968. Coming back over the pond, Bryan took a post as Lecturer in Geology at Edinburgh University until 1981. During this time, he was also a consultant to oil and mining industries, and founder and Chairman of Petrological Services Edinburgh (1980-1981).

Alongside Geology, Bryan also found time for politics, and was the Scottish Liberal Party energy spokesman from 1978-1979. He stood against Gordon Brown in the parliamentary elections in May 1979 for the Edinburgh South Seat. Bryan worked with BP Exploration between 1981 and 1996, joining as Chief Sedimentologist. Subsequent roles included Exploration Manager and General Manager Ireland, International Exploration Manager with special responsibility for Middle East, and Head of Recruitment, BP group. Bryan continued his involvement with the oil industry as a consultant after leaving BP.

During his time with BP, Bryan was appointed OBE in 1989 for services to Anglo-Irish relations. Since 1996, Bryan has been a Senior Research Fellow in Earth Sciences at Cambridge University. Bryan is renowned for his expertise on global warming, publishing 'Challenged by Carbon: the Oil Industry and Climate Change' (Cambridge University Press) in 2009.

Dr Bryan Lovell was elected President of the Geological Society of London in 2010.

It was with great sadness that the Department learned of the death, on 27th June 2010, of Dr Martin Dodson, a Research Fellow and DPhil student between 1958-1963.

Martin was a member of the geochronology group at Oxford. Geochronology was still in its comparative infancy as a discipline and Martin was to be one of the scientists instrumental in its rapid evolution. Indeed, one of his first tasks, in the absence of a suitable commercially available instrument, was to build a gas mass spectrometer.

Martin was appointed as Lecturer in Geochronology and Isotope Geology at the University of Leeds in 1964, where he remained until his retirement in September 1992.

Martin was a man of considerable intellectual stature and ability, and his research reflected his wide interests in both physics and Earth Sciences. He published some 45 papers between 1961 and 2006, eight of which were published in the journal Nature.

Among the many messages of condolence from colleagues across the world it is notable how many commended, in addition to his scientific achievements, his great warmth, gentle demeanour and concern for the well-being of others. He was much liked and respected, and will be greatly missed by all who knew him.

Taken from an obituary by Professor Marjorie Wilson (St Hilda's, 1971), Leeds University.

Simon Winchester (St. Catherine's, 1963) has recently published a new book "Atlantic, a vast ocean of a million stories" with HarperCollins. If you would like more information, please contact Hannah Jackson at the address overleaf.

Tony Eccleston (St. Catherine's, 1965) retired as Director of Social Care and Learning for Bracknell Forest Council in July 2008. He now works part time chairing some safeguarding children boards in south west London. The rest of the time he is living in Andalucia where he and his wife have a house in the mountains in the south of Córdoba Province.

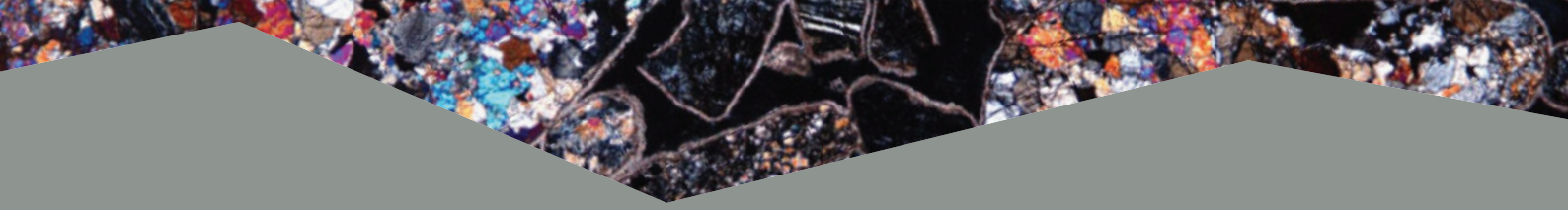
Graeme Bagley (University, 1983) is about to take up a new role with BP, where he will be looking to deepen relationships between BP and the Earth Science/Geology Departments of various UK universities.

Lorcan Kennan (Wolfson, 1989) Has taken up a new post with Shell in The Hague.

Philip Clegg (Jesus, 1997) and his wife Evie are pleased to announce the birth of their daughter, Sienna Grace on August 5th, 2010.

Anne Osbourne (Worcester, 2001) is currently living in Hamburg, where she is undertaking a German Language course as the first part of her Alexander von Humboldt Fellowship. During the next two years she will be undertaking post-doctoral research into the timing of the closure of the Central American Seaway. Anne completed her doctorate in the Earth Sciences Department, Bristol in 2009.

Dr Nick Badham (St. Edmund Hall, 1966) died unexpectedly on the 19th June 2010, peacefully and doing what he loved, whilst on a geological field trip in Spain.



Alumni Drinks Receptions

On the 19th and 26th November 2010, the Department of Earth Sciences will be hosting informal Alumni Drinks Receptions to celebrate the opening of the New Building. There will be tours of the New Building, and a chance to meet up with old friends and discuss current Departmental research with academics and students.

Where: Senior Common Room,
New Earth Sciences Building,
South Parks Road,
Oxford OX1 3AN

Timings: 5.30pm-8.30pm

Dates: Friday 19th November,
Friday 26th November

Dress Code: Informal

RSVP by November 12th to
hannah.jackson@earth.ox.ac.uk

Annual Alumni Dinner

The Annual Dinner 2011 will be held on Friday 13th May at University College. This will also be a celebratory reunion for those who matriculated in 1960 and 1961.

Alumni Benefits

Alumni of the University of Oxford are entitled to an ever-expanding range of benefits and services, from discounts associated with the Oxford Alumni Card to exclusive holidays and opportunities for professional development.

To register for an Alumni Card, contact **hannah.jackson@earth.ox.ac.uk**, or visit **www.alumni.ox.ac.uk/benefits**

All Alumni are now eligible for an Oxford forwarding email address, for more information visit **www.alumni.ox.ac.uk/benefits**.

The Oxford Careers Service provides careers support for life for all Alumni: **www.careers.ox.ac.uk/alumni**.

Find us on Facebook and LinkedIn; search for **Oxford Earth Sciences Alumni**

All this information, and more, is online:
www.earth.ox.ac.uk/alumni

We hope you enjoy receiving this annual newsletter. We are interested to hear your views and comments, and are always happy to receive contributions from Alumini of the Department.

Please write to Hannah Jackson at the address below, or send emails to
hannah.jackson@earth.ox.ac.uk

Front cover image
Villarica, Chile,
taken by Professor David Pyle

Hannah Jackson
Alumni Relations Officer
Department of Earth Sciences
South Parks Road, Oxford OX1 3AN

UNIVERSITY OF OXFORD