EARTHSCIENCESNEWS

UNIVERSITY OF OXFORD

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WELCOME

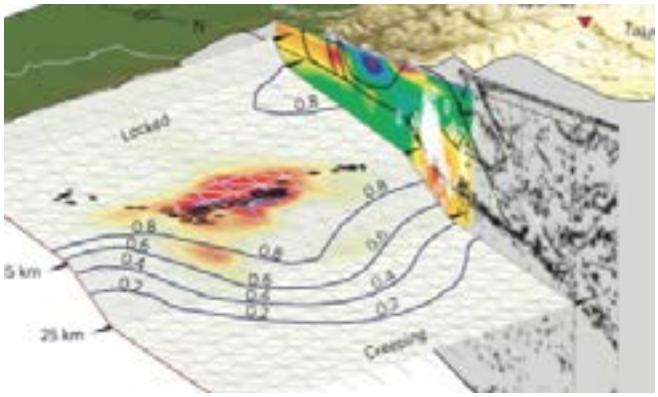
Professor Gideon Henderson
Head of Department

Since I last wrote, there has been much to celebrate, and much to reflect on.

The Department was shocked, late in 2014, by the death of Martin Brasier in a road accident just outside Burford. A tragic loss for the many who counted him as a friend and mentor, and coming just as Martin was pouring his energy into exciting post-retirement projects. Last year we also said farewell to Eric Whittaker, lecturer and reader in the Department from 1965 to 1983, who passed away peacefully at the age of 86. Martin and Eric are remembered on pages 18-19.

Last year also brought news of the terrible earthquake in Nepal which took such a huge toll on the country and its people. Members of the Department were in the area at the time, but were thankfully unharmed, while another, Mike Searle, was about to lead an alumni trip to the region to share his expertise on Himalayan geology. That trip was rescheduled, and Mike has been helping a village he visits frequently during fieldwork to rebuild after the disaster (as you can read overleaf). Since the disaster, our geological and geophysical expertise has helped to understand the nature of the fault that failed, and the implications for future earthquake risk in Nepal (see figure below).

Our research in Nepal is one example of the many ways in which the earth sciences can help developing countries. Postgraduate Joshua Combs narrates his experience of research into natural resources in a remote region of the Sahara on pages 6 & 7, and provided us with the rather stunning cover image from that trip. Those of you who attended our panel discussion in London last year will have contributed to a broader discussion on the subject, which touched on geoscience education, the search for natural resources, and on assessment of environmental and geological hazard. Earthquakes and volcanic hazards are present in many developing countries, and departmental research seeks to link the latest understanding of these geological processes to policy in developing countries through two large programmes, including the aptly named Earthquakes without Frontiers consortium. I've never got to the bottom of the inspiration for this name; Médecins Sans Frontières, or Peter Gabriel? But it nicely captures how research crosses borders, as does the danger from earthquakes: faults don't know about national boundaries.



Three-dimensional block diagram of the geometry proposed for the Main Himalayan Thrust reproduced from a paper in Nature Geoscience by Dr John Elliott (Univ 2005). See tinyurl.com/nepalfault for further details.

Several other large research projects have started since the last edition, including three funded by the European Research Council. These large grants enable grand scientific challenges to be addressed, and we will use them to investigate the relationship between mantle structure and continental geology (Karin Sigloch); to use new measurement technology to assess the evolution of vertebrate morphology (Roger Benson); and to understand the relationship between trace-element geochemistry and life on the planet (Ros Rickaby). Each are tremendously exciting projects; we will share some of their forthcoming results in future issues. They join a number of other projects in the Department that are funded from Brussels (including one described on page 8). Whatever the outcome of the referendum on June 23rd, I greatly hope that we can continue to benefit from access to European funding (and the free movement of scientists and students between European countries).

It was great to have the vibrancy of our research recognized during the last Research Excellence Framework; the comprehensive five-yearly UK-wide assessment of all academic departments. Oxford Earth Sciences (with our partners, the Oxford Museum of Natural History) ranked first amongst the 45 Earth and Environmental Sciences submissions, narrowly (but of course critically) knocking Cambridge down to second. So you can take pride in being alumni of the best earth-sciences department in the country.

The Department has been first in other ways in the last year. We were the first department in Oxford to be allowed to follow the colleges' lead in telephoning alumni (see page16 for details). Earth Sciences was selected because of the breadth and depth of support that our alumni have shown over the years, and I hope those of you who spoke to our student callers enjoyed the conversation. Very many thanks to all who shared their experience, and to the many who offered financial support to undergraduate field-work during this first telethon.

MEET THE TUTORS

In 2013, new tutorial fellows were installed in two of our undergraduate colleges. Some of you may have met them at college events, but here we introduce you to their research interests:

Professor Karin Sigloch - Exeter

Karin took over from Professor Shamita Das to maintain Exeter's ongoing dominance in Geophysics. Karin's research uses earthquakes to determine the nature of fundamental structures in the Earth. When she's not giving lectures and tutorials, Karin can be found deploying seismometers from research vessels in the Indian Ocean.

Featured in Wired magazine in October 2014, Karin observed: *"It's harder to do science looking inside our planet than looking at the skies,"* she says. *"Space is transparent and electromagnetic waves travel easily. To look into the interior of the Earth, we have to harness earthquake waves, but they are sparse. We need to look in the oceans."*

Professor Lars Hansen – University

Lars took over as the Sollas Tutorial Fellow in Geology at Univ when Gideon Henderson became Head of Department. When not entertaining alumni with demonstrations involving ketchup, Velcro, Guinness and Cheerios in milk[1], Lars conducts lab- and field-based experiments to investigate the rheological properties of rock. His research includes the mechanisms of viscous deformation at the atomic scale and the manner in which those mechanisms control the dynamics of the solid Earth at the scale of tectonic plates.

[1]Lars gave a wonderful informal demonstration of his research at the recent London gathering, using various common foods and drinks as props.

Wreckage in the Gorkha region, viewed from the air.
Wreckage in the Gorkha region, viewed from the air.

25TH APRIL GORKHA EARTHQUAKE NEPAL

MIKE SEARLE

On 25th April 2015 a Magnitude 7.8 earthquake struck the Gorkha region of central Nepal. The quake initiated at 15 km depth along the main detachment along which the Indian plate is underthrusting the Himalaya. It ruptured the Main Himalayan Thrust fault a distance of 150 km eastward resulting in the rocks beneath Kathmandu moving over five metres south and the land north of Kathmandu rising by over one metre.

Unusually the earthquake did not rupture to the surface, suggesting that the immense stress build up remains buried beneath the Himalaya. Aftershocks continued after the main earthquake with the main damage from the Gorkha region east to Ganesh, Langtang, Jugal Himal and the Kathmandu valley. The earthquake triggered many huge rock and ice avalanches, the most devastating of which occurred in Langtang. A massive rock fall down the south face of Langtang Lirung completely buried the village of Langtang where three storey houses were totally buried, killing every person in the village. On Everest climbers were stranded above the icefall when huge avalanches crashed down from the Lho-la wiping out the route between the icefall and base camp site.

Over 9000 people were killed in this disaster, and more than 500,000 houses were destroyed. Despite this, the devastation could have been much worse; the earthquake struck in the afternoon on a Saturday when schools were empty and many people were outside working in the fields. Three million people were made homeless, with little opportunity to rebuild before the monsoon arrival in early June. Several World-Heritage sites including 12th century temples in Durbar square, Kathmandu, Bhaktapur and Patan were destroyed. The World Bank estimates that $6.66 billion is needed to rebuild the country.

For over 10 years I have been working on the geology of the Nepal Himalaya and have employed porters and sirdars from two villages, Kashigaon and Yarsa in the Gorkha Himalaya. They were always hard-working, happy and proud and many became good friends. Kashigaon, like many hill villages in rural Nepal, was badly affected by the earthquake. Located right above the epicentre, over 50 houses collapsed, killing many people inside, and the remaining houses were left badly cracked and unsafe. Many of their buffalo and other animals were killed, and landslides wiped out several of their fields. Across the Burhi Gandaki valley, villages like Laprak and Barpak were totally flattened with every house destroyed and hundreds of people killed.

I was due to fly to Kathmandu one week later, to trek to the Annapurna Base camp with a group of Oxford and Cambridge Alumni Travellers. Of course we had to postpone our trip, but when I found out about the level of destruction throughout central Nepal I was horrified. Since the government had more pressing

needs in Kathmandu and Langtang, we decided to 'adopt' Kashigaon and Yarsa villages and help with their rebuilding efforts. We set up a fund supported by members of the Department of Earth Sciences, Worcester College and our local Himalayan pub, the 'Rose and Crown' in North Parade. In three weeks we raised over £8000 which was sent directly out to Kashigaon. Three locals, headed by sirdar Suka Ghale, made several trips to buy food, tents, tarpaulins, tin roofs and basic building materials so villagers could start to rebuild their homes. Supplies were carried on foot to the village, which is one day's walk from the end of the road at Arughat Bazar, up steep mountain paths on the Ganesh side of the Burhi Gandaki valley.

Almost a year later, with an additional £23,000 in funding, Kashigaon residents are looking forward to the opening of their new village school, thanks to funds raised in the UK and Australia via Community Action Nepal (CAN), a registered UK charity set up by mountaineer Doug Scott that has built schools, hospitals and porter shelters across Nepal for the last 25 years. CAN now aims to provide long-term support, by funding teachers, health workers, and eventually a medical centre in the village.

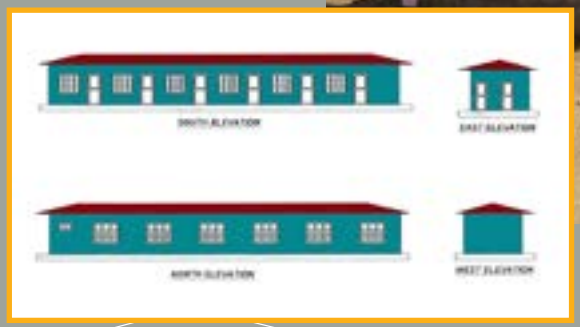
For further information, see our facebook page – **www.facebook.com/Kashigaon**

Above top: Laprak villagers porter relief supplies up the mountain.

Above bottom: Suka Gale with supplies to be helicoptered to Kashigaon.

Right: Children at play outside the completed school building.

Below: Plans drawn up for the new school in Kashigaon.



PICNIC IN THE DESERT

JOSHUA COMBS (WOLFSON, 2014)

Nothing beats a camel sunset in the Sahara

"Walking around you can feel beads of sweat running down your back, collecting in a large, damp patch at the bottom of your shirt. After a few weeks in the desert without a proper wash, you have a sticky feeling behind your knees where the sweat has accumulated since you were last given a five-litre ration of water for washing - water being the most precious resource in the field. It's not the most pleasant state of being but the experience more than makes up for it. Just one Saharan sunrise makes the whole thing worthwhile. The untouched beauty of the terrain, the unknown adventures that lie ahead and the experience of sleeping under the Saharan stars free of light pollution every night, makes field trips to Western Sahara one of the best things you could do with your life."

Western Sahara is a disputed territory in the Maghreb region of northwest Africa. It is one of the most sparsely populated regions of the world, administered by one of the longest running United Nations peacekeeping missions. The western two thirds of the country are illegally occupied by Morocco, while the eastern third is governed by the Saharawi people, who have proclaimed the country the Saharawi Arab Democratic Republic (SADR). The Saharawi Government has recently initiated programs in the Liberated Territories of the country that will result in a better understanding of the geological and metallogenic evolution of this *terra incognita*.

Funded by Australian company Hanno Resources, I am undertaking a research project aimed at improving the geological understanding of the region. Due to the political situation in Western Sahara, very little geological mapping work has been accomplished since the relinquishment of the colony by Spain in 1975. The most recent work was carried out by Spanish geologists in the 1950's, when a 1:1,000,000 scale map was produced of the entire country in a short amount of time. As a result of the extreme remoteness of the field area in the Sahara desert, the Reguibat Shield (covering areas of Western Sahara, Algeria and Mauritania) is drastically understudied. More than four times as many publications were written about the geology of Mars in 2015 alone than have been written in total about the Reguibat shield, with virtually nothing written on the geology of SADR.

Under the guidance of Visiting Professor Laurence Robb, Associate Professor Dave Waters and Caedmon Marriott (Univ, 2000), CEO of Hanno Resources, I have produced the first geological map of the 12,500km^2 contact zone between Archaean and Paleoproterozoic terranes in the Reguibat Shield. This includes some extremely exciting changes to the existing understanding of the geology, which were previously based on extrapolating geology mapped on the Mauritanian side of the border. The study is aimed at providing an improved tectonic and metallogenic framework for the region using field mapping, petrological and geochronological studies, and metallogenic interpretation.

Exciting new discoveries have already been made in these early stages of the project including the discovery of ophiolite-like oceanic crust, the discovery of a previously unknown anorthosite complex of unknown age and provenance, and a volcanic arc system with high potential for hydrothermal gold and copper-gold mineralisation.

Working in this environment isn't without its fair share of challenges. The remote field area takes three and a half days of travel to reach, including two flights (one overnight) and two days of driving through the desert escorted at all times by Saharawi military personnel. There are no roads and everything needed for the duration of a field trip needs to be carried using pickups and Land Cruisers. Careful planning is required in advance as everything from food, water, fuel and toilet paper needs to be brought in adequate quantities. With no Tesco within 2000 miles, if you run out of any of these in the field, you could be in trouble!

Rations aren't the only issue. With temperatures in excess of 40 C and no air conditioning, the workday is carefully planned with a break during the heat of the day, during which time the chef (previously the personal cook for the President of the SADR) prepares lunch. Additionally the presence of dangerous animals such as snakes and scorpions in the field means that you have to be always on your toes.

In November 2012, before starting at Oxford, I was fortunate to make an important discovery, becoming the first person to find visible gold in SADR. This discovery was closely followed by a second gold occurrence discovered by local Saharawi geologist and PhD student Saleh Lehbib, of the Universitat de Barcelona.

Geology aside, the untouched nature of Western Sahara means that there is plenty of opportunity for amateur archaeology. The land is dotted with ancient burial mounds, crescents and petroglyphs dating back over 3000 years. Alongside the larger monuments, it's not uncommon to find pristine flint tools, such as spear and arrow heads, scattered on the ground. The locations of significant archaeological sites are being recorded for future studies.

Companies and individuals interested in similar funding opportunities should contact our External Relations Officer, Claire Grainger, on claire.grainger@earth.ox.ac.uk or call +44 (0) 1865 272031.

Joshua Combs (right) and Saleh Lehbib (left) hold the first and second pieces of gold found in Western Sahara.

Laurence Robb, Josh Coombs and Caedmon Marriott, taking a break in the desert.

Its great to be collaborating with my old department and supporting the DPhil studentship in this exciting project area. Leveraging the department's expertise is a real win-win for Hanno Resources and is already yielding great results."

Caedmon Marriott (Univ, 2000),
Managing Director of Hanno Resources

4000 year old Archaeology. Looks like some sort of sundial to me.

A SAMPLE OF SIBERIA

DR MEL MURPHY

In May 2015, Don Porcelli (Lobanov-Rostovsky Associate Professor) and Mel Murphy (Post Doctoral Research Associate) embarked on a month-long expedition to sample trace-elements and organic carbon in the Lena River in Siberia as part of the EU-funded MetTrans project. Their goal was to understand the melting of permafrost and its influence on chemical fluxes to the ocean. They timed their visit to coincide with the annual spring flood.

The Lena River is one of the largest rivers flowing into the Arctic Ocean, and drains a Siberian catchment of two and a half million km^2. Much of this catchment is permafrost; ground that is frozen thoughout the year and is highly vulnerable to climate change.

As climate warms, permafrost is expected to thaw to greater depth, increasing the thickness of the layer that undergoes seasonal thawing and freezing and leading to surface subsidence and formation of localised unfrozen areas. This will result in the exposure of more readily weathered rocks, more interaction between water and rock, and increased river runoff. Dramatic changes in the input to the Arctic Ocean of carbon from the melting permafrost are anticipated, along with fluxes of trace metals including the nutrient, iron, that may alter ecosystems of the ocean. Despite the fact that nearly a quarter of the northern hemisphere is underlain by permafrost, little is known about how its future thawing might affect such geochemical fluxes, and the general environment of these high-latitude regions.

Cat separating colloids and particles in a portable field "clean-room" to prevent contamination.

Mel taking a sample to measure the alkalinity back in the lab.

To be in Siberia to witness the ice starting to break up and the river rapidly rising up over its banks is amazing. The sheer volume of water this river transports is incredible" says Mel. "It's amazing to see such dramatic changes in the landscape over such a short period of time, and to imagine the sheer volume of water flowing into the Arctic Ocean every year during the spring flood."

Map of the Lena River watershed showing permafrost coverage and sampling locations for the 2012/13 expeditions.

During the winter months, air temperatures are as low as –50°C and the Lena River is completely frozen. As the temperatures rapidly increase in May to early June, snow and ice begin to melt in the river catchment area. This causes the rivers and tributaries to swell, inundating the river banks and flooding the low-lying areas in what is known as the "spring flood", where it contributes more than half of the of the total annual discharge into the Laptev Sea. It was during this time that Don and Mel visited to sample the River system. They were joined by Professor Per Andersson, from the Swedish Museum of Natural History and a PhD student from Sweden; former Oxford undergraduate, Catherine Hirst (St Peters 2008). The team sampled the Lena River main channel near the Tabaga hydrometrological station, about 37 km upstream from the town of Yakutsk (Якутск). The first sample was taken at the beginning of ice melt on the river, and then every three days for the month of May.

Strong seasonal changes in the thickness of the thawed layer dictate how waters interact with soils, and may influence intra-annual riverine geochemical signatures. This has implications for predicting how permafrost-dominated regions might respond to changes in climate in the past and future. Samples from this recent field work are being compared with those from those collected during the summer where water flows through the thawed layer of the permafrost, rather than over the surface as surface run off during the Spring melt. This research will provide important information about the key processes which control the carbon, iron and trace metal cycling in the Arctic.

Lab Analysis: What happens next?

To unravel a river's composition, geochemists subdivide the water into the particulate and dissolved load. Water collected in the field is filtered to separate out larger particles, and then dialysis separates the smaller particles (colloids) from the dissolved fraction. [Dialysis membranes are filled with ultraclean water, prior to fieldwork. One dialysis membrane is placed into a container of filtered river water and the membrane is left for 3 days to equilibrate with the river water. Following this, the water in the membrane is removed, inside a portable clean hood, and stored in a bottle, ready for analysis.] The chemical composition of the three different fractions (particles, colloids and dissolved) is determined using spectroscopy in the labs in Oxford. The team also used the soft X-ray scanning transmission X-ray microscope (STXM) facilities at the Diamond Synchotron partyical accelerator in Harwell to determine speciation of iron associated with the colloids, particularly the mineral phase present in the Fe-oxyhydroxides and the speciation of iron in the organically bound particles.

https://mettranssiberiablog.wordpress.com/

Mel and Cat beside their transport for the trip

TEACHING MICROSCOPES OUT WITH THE OLD AND IN WITH THE NEW

Top: Jack Haynes and Peter Spooner (both Univ 2009), working with the old microscopes in 2010.

Bottom: Microscope magicians Owen Green, Chris Kennedy, Matt Harbin, and Alan Todd.

After forty years or so of faithful service, our teaching microscopes were finally replaced last summer.

Two models were taken out of service, the Prior-Swift MP81 and the Swift MP120, the last all-British made polarising microscope. Nurtured well beyond their expected retirement age by the Department's technical staff, the teaching microscopes had served generations of students, including some who now sit on the Faculty, such as Gideon Henderson (Hertford 1986), Richard Walker (St Edmund Hall, 1995) and Stuart Robinson (St Edmund Hall 1995).

The microscopes have been replaced by one model, to simplify teaching and reduce the amount of time spent 'tweaking' different instruments during practicals. Following the examination and testing of many microscopes the Leica DM750P was recognised as the most suitable instrument to fulfil the requirements of our undergraduate teaching. We are grateful to Alan Todd of Microscope Services, who serviced the old microscopes for many years, and lobbyied on our behalf to get the best possible instrument as a replacement. We also thank Matt Harbin, North European Sales Manager at Leica Microsystems, who offered a substantial discount to make this purchase possible.

Dr Stuart Robinson remarked: *"The current crop of microscopes were being used when I was an undergraduate at Oxford in the mid-1990s. At that time they were far from new and, unsurprisingly, the quality and total number of microscopes have declined over the years. The difference in image quality between the current teaching microscopes and the basic Leica is astounding. The quality of the Leica microscopes should ensure that they withstand many years of use. Furthermore, the potential opportunities presented by the Leica scopes for digital image capture could allow new methods for students to document their observations, or share problems with each other and tutors."*

As Professor David Pyle noted: *"Practical petrology teaching remains an essential and integral element of the Earth Sciences course, and allows students to access the accumulated wealth of Oxford's research and teaching collections. Students' observations and interpretations of thin sections of rocks collected during their independent mapping contribute substantially to their third-year dissertations; and a significant number of students use a component of microscope work during their independent fourth-year research projects."*

2nd years Kate Davis (Univ 2014) and Flora Palmeri (St Anne's 2014) using the new microscopes in an igneous petrology class.

For those of you without a microscope, but for a longing to remember how to distinguish epidote from diopside (or just to look at some pretty images), these websites provide a compilation of images:

Example sedimentary, igneous and metamorphic rocks **http://tinyurl.com/thinsections**

Metamorphic minerals **http://tinyurl.com/metmins**

These websites are maintained by David Waters, Associate Professor of Metamorphic Petrology, and Curator of the Earth Collections at the Oxford University Museum of Natural History.

Alumni Purchases

Many of our old, but well-maintained Swift microscopes have found permanent homes with various alumni, geology teachers and researchers, who purchased them for everyday use, back-up or simply nostalgia. We even had enquiries from the US, until the difference in power supplies proved to be an unsurmountable incompatibility. Two of the MP120 microscopes were sent to the Bermuda Institute for Ocean Science (BIOS) to support the undergraduate field trip, while others have been dispatched to Spain, the Netherlands and throughout the UK.

We are grateful to the following alumni who purchased old models, and also to many teachers and geology enthusiasts.

David Bailey
John Bennett
Bernard Besley
David Cooper
Simon Harmsworth
Keyron Hickman Lewis
Carol Lister
Alex & Emma Liu
Ian Marson
Paul Mann
Sian May
Nick Richardson
Lisa-Marie Shillito
Simon Shoulders
Mike Sumbler
Amy Tims
Geoff Townson
David Whitmarsh
David Wright

The first MP120 was sold to David Bailey (Univ 1981). David worked for many years at the BGS, before setting up his own consultancy a few years ago. He is now the secretary of the Earth Science Teachers Association (ESTA). By advertising to this network, we've been able to furnish many classrooms with polarising microscopes.

Geoff Townson (New, 1968), was intrigued about the possible purchase, commenting, *"I assume they are polarising mineralogical microscopes – maybe even the same black ones I used to demonstrate with 1968-71?!" Geoff is a regular speaker and tour guide on the Jurassic Coast, and is keen to put the microscope to regular use."*

Richard Porter (St Peter's 1998), who returns regularly to give careers talks to students in the department, was reminded of his DPhil days: *"It seems only a short time ago since the autumn of 2001, when I was sitting in the basement of the 10 Parks Road Palaeo labs working on microfossils (forams and ostracods) from the south-west England Triassic-Jurassic boundary with Steve Hesselbo and Martin Brasier. I continue to use the knowledge I gained in my job as a Shell clastic sedimentologist, especially when working with biostratigraphers."*

As John Bennett (St Edmund Hall 1972) was collecting his microscope, he mentioned that he had an old R & J Beck microscope manufactured in 1912, a model known as the London Microscope, which had been purchased when his father was a medical student in the 1920's. Our Geofacilities Manager, Owen Green, offered to clean and service the old microscope, which he returned in full working order to a delighted Bennett family.

OUTREACH AND PUBLIC

The earth sciences provide unique insight into the application of maths, physics, chemistry and biology to problems such as climate change and our ability to cope with natural hazards. As such, members of our department are able to offer valuable hands-on experience to help children learn about the world around them. School children are exposed to many topics throughout the school curriculum, and we have been sending people to help make the most of this experience: from schools visiting their local quarry, students bringing learning to life in the classroom with samples and demonstrations, or building multi-layered stratigraphy cakes.

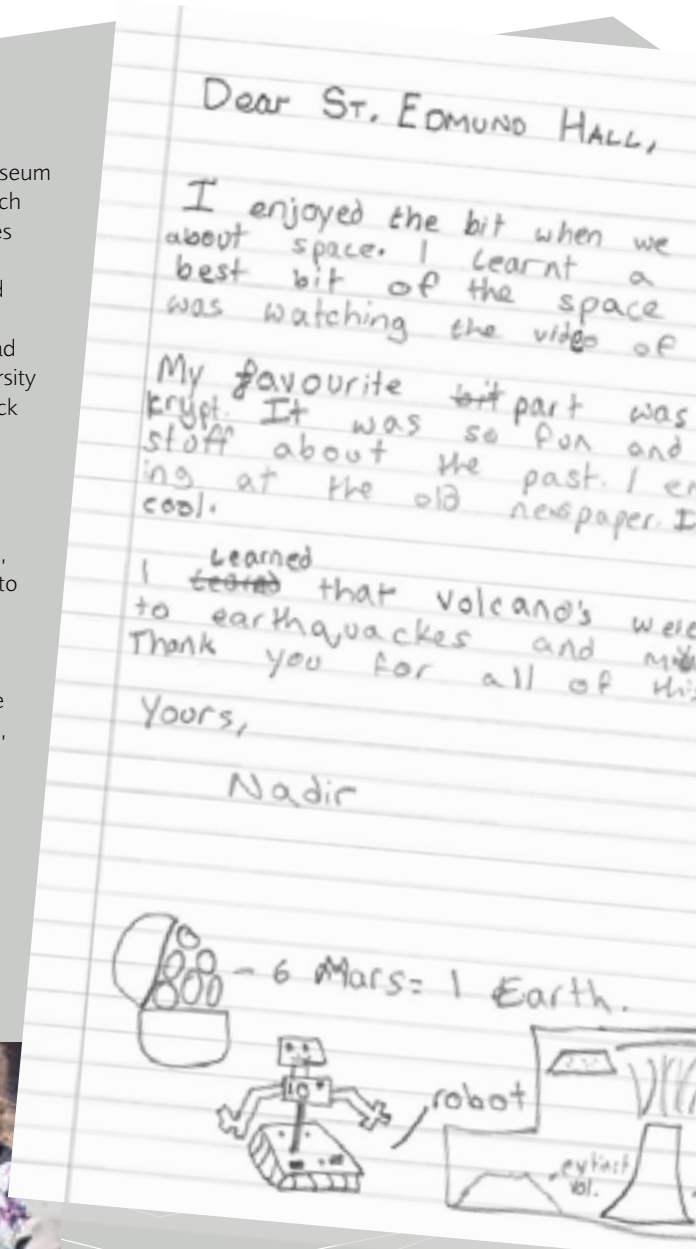
Over the past twelve months, various members of the department have been involved in activities to bring science to life. Here are a few examples which caught our eye:

Primary Science Day

In May 2015, 50 pupils from Rose Hill primary school visited St Edmund Hall for a Geology-themed science day. A joint event with the College, Department and Museum of Natural History, the activities were organised and delivered by OUMNH Research Fellow Dr Allison Daley, Research Fellow Jon Wade, Postdoctoral Researcher James Moore, graduate students Victoria Elliot, Gemma Benevento, Rebecca Morgan, and undergraduate Grace Manley. The pupils took part in sessions themed around volcanoes, fossils and 'Earth Moon and Mars', along with a brief walking tour of Oxford. Despite being only 20 minutes away by regular bus, many of the pupils had never experienced the academic side of Oxford before, nor considered the University as a possible future destination. As shown by the example to the right, the feedback from the students was extremely positive, and we hope this event will become a regular fixture.

UNIQ Summer School

The UNIQ summer school is one of the University's more direct outreach activities, to encourage bright A-Level students from 'non-traditional' backgrounds to apply to Oxford. Those might be state secondary schools with little experience of students applying or achieving places at Oxford, students on free school meals or in certain postcode areas, or looked-after children. Students attend lectures, practicals and tutorials run by faculty and postdocs in the department, and stay in colleges where they experience the quintessentially Oxford delights of study-bedrooms, hall food, bops, and porters. The formula works wonders. In the first four years, 60 students attended the week-long summer school. 20 attendees then applied to do the Earth Sciences course at Oxford, many of whom had never previously considered doing so, and 10 were offered a place. Holly Unwin (Univ 2014) attended the UNIQ course before applying to Oxford, and then worked as a student mentor on the course in 2015: *"The UNIQ course allowed me to experience Oxford life for a whole week, staying in a college, going to lectures, etc. They even put on a bop! It helped break down some of the myths, and I could see that I would really enjoy studying here."*


Dear St. Edmund Hall,

I enjoyed the bit when we about space. I learnt a best bit of the space was watching the video of

My favourite ~~bit~~ part was krypt. It was so fun and stuff about the past. I en ing at the old newspaper. I cool.

I ~~learned~~ learned that volcano's were to earthquackes and Thank you for all of

Yours,

Nadir

- 6 Mars = 1 Earth.

robot

Students on the UNIQ summer school (using the old microscopes!).

ENGAGEMENT

Images of the volcano outside the Museum of Natural History in October 2015, including (top) postgraduate Maria Tsekhmistrenko (St Edmund Hall 2014) in the Volcano Observatory tent.

Volcano on Tour

Professor David Pyle took a Volcano on tour this summer, as part of the Natural Environment Research Council (NERC) 50th Anniversary Summer of Science celebrations. From the British Geological Service open day in June, to the Harwell Science Campus open day in July, to Einstein's Garden at the Green Man Festival in August, a whole new set of audiences were exposed to the concept of volcanic hazard, and how scientists and governments work together to monitor, predict and minimise the risk of volcanoes.

The finale of the tour was a two-week residency at the Museum of Natural History in October. School groups from primary to A-Level were guided through a variety of activities by members of the museum's outreach team, and volunteers from the department. During half term, these activities were then opened up to families, with table-top eruptions, a miniature 'Volcano Observatory,' volcano poetry, games of Top Trumps and more. On Friday night, there was then a dramatic night-time eruption of the Volcano. With readings from contemporary accounts of the 1902 eruption of Soufriere, recounting the terrible devastation suffered, 300 or so visitors were able to reflect on the very real impact of living in areas of volcanic risk, before witnessing a dazzling display of smoke, gas and flames.

Lauren celebrating with team-mates after the 2015 Boat Race.

GEOLOGISTS SING THE BLUES

Love it or loathe it, the 2015 Boat Race made history when the Women's race was held for the first time on the Tideway on the same day as the Men's. One of our undergraduates, Lauren Kedar, rowed in that historic race. With a number of our students achieving Blues this year, we looked at the highs – and lows – of the lives of our sporting students.

Lauren Kedar (Exeter 2013), OUWBC

For any second year undergraduate, rowing in the University first boat would be quite an achievement, but 2015 saw Lauren selected for the second year in a row. Having started out at Reading Rowing Club as a teenager, Lauren has rowed as a GB junior in the 2012 and 2013 World Championships. When asked how those events compared to the Boat Race, it was surprising to hear that the latter made more of an impact. *"The press coverage and support from the crowd on Boat Race day is just incredible, it makes it a much bigger event. World Champs are often held abroad, with not much visible support from spectators on the bank, and so the level of excitement just isn't the same."*

When asked how social life and academic study fit in, Lauren is quite measured: *"My social life is rowing, pretty much. We go out to Wallingford at 5:45am to train on the river before lectures, and we're in the gym from 5:30-8pm most evenings. It can be tricky just fitting in time to eat in hall with other students, and any spare time has to be spent completing work for tutorials. But my fellow squad members are all very supportive, and we do have fun – in our own way."*

Lauren hopes to be chosen again this year, and is looking forward to racing once again on the Thames. Beyond rowing, her ambition is to do research with the British Antarctic Survey.

Anna Bidgood (St Anne's 2011), OUWRFC

HOW DID YOU GET YOUR BLUE?

I have been playing rugby union for 2 years, since September 2013, when I turned up to pre-season training to give it a go and loved it! I started off as a hooker but soon worked my way back to flanker.

HIGHLIGHTS

Winning both Varsity matches (Blues and 2nd team) in 2014! For my first Varsity matches, I played for the 2nd team and benched for the blues. The second team had a convincing win and the blues fought hard for a 17-12 victory.

BALANCE

We train a lot at weekends and in the evenings but it's usually a good break from work. Rugby is a great way to let off steam and helps with productivity at work. However it does make you very hungry which can be distracting!

FUTURE PLANS?

Play at Twickenham stadium (bring on Varsity 2015) and become an expert on all things metamorphic….

Graeme MacGilchrist (Univ, 2013) OURFC

HOW DID YOU GET YOUR BLUE?

I have been awarded two blues in rugby union, coming off the bench in the Varsity Matches in 2013 and 2014. I play in the 2nd row.

HIGHLIGHTS

The whole experience of being a part of the Oxford University Rugby Football Club. It is quite unlike any rugby club I know, and having the focal point of the Varsity Match makes the experience truly unique.

BALANCE

During Michaelmas term, it is a struggle. Rugby becomes very time consuming and puts a big constraint on the flexibility of your office hours, so that you need to be efficient in the time you have. After Christmas, however, the rugby is much less intense, and academic work is given the time to catch up. It helps having very supportive supervisors.

FUTURE PLANS?

I will probably not play rugby beyond Oxford, making these last years all the more special. Having played since I was 8, the sport has given me a huge amount but it has taken its toll on my body.

James Scaife, (Linacre 2013) OURFC

WHAT WERE YOUR BLUES HIGHLIGHTS?

The 133rd Varsity Match was one to remember as Oxford beat Cambridge by 43 points to 6 at Twickenham to achieve an Oxford record of five consecutive Varsity victories. Oxford also broke the record for the highest winning margin which stretched back to 1910 as they became the first to score more than 40 points in the long standing battle between the two universities.

It was an incredible experience to be part of this match but even more so the journey leading up to it. The positive attitude and comradery of the club continues to be our most important asset, something which I think really showed on the day.

EARTH SCIENCES TELETHON

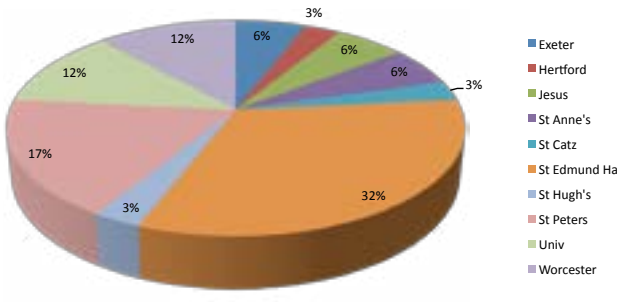
Thank you!

In June 2015, students from the department made contact with many of our alumni during our first ever telethon. As the first department to undertake such an activity, we weren't quite sure what to expect, but we were certain our student callers Sean, Emily and Ben would have interesting and informative conversations with the alumni they called.

The purpose of a telethon is two-fold, as those of you who are veterans of college telethons will know: reconnection and fundraising. An important element is re-connecting with our alumni: discovering who has (or indeed hasn't!) been hearing from us over the last few years, evaluating our alumni programme, finding out what career paths people have taken, and signposting the various ways in which alumni can connect: through careers talks, offering internships to students, attending events, providing mentoring, or joining us on field trips.

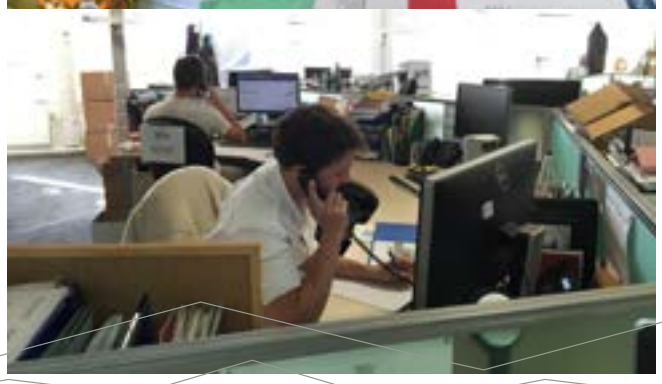
The fundraising purpose of our telethon was the opportunity to secure the future of bursaries to support the independent mapping projects of our undergraduates. Colleges and the Department contribute funds to support their mapping, but those funds are under threat, given present government funding. We were delighted that so many alumni supported this cause. 47% per cent of those called showed support with either a monthly, annual or single gift, and we have doubled the number of alumni supporters to the department.

Donors by College

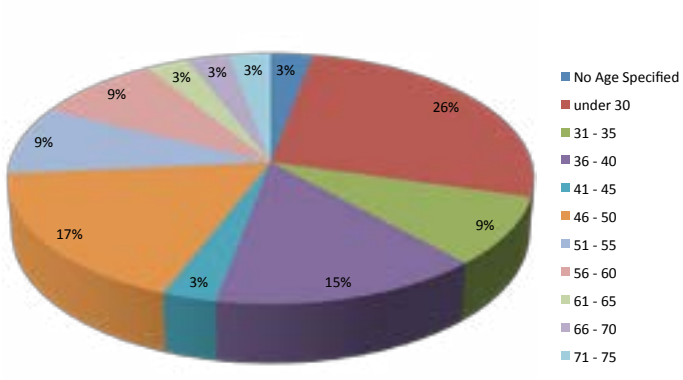


One thing that was most striking was the number of young donors who signed up. 53% of those aged 50 or under made a pledge, constituting 70% of all donors. We are aware that this age group have perhaps the most connection with the department and fellow alumni, and are therefore working to strengthen connections and opportunities for alumni who graduated before the 1980s.

If you did not receive a call, we hope to repeat our telethon in September 2016. We very much look forward to these conversations. In the meantime, if you would like to support the department, please do make an online payment at www.giving.ox.ac.uk/earthsciences.



Donors by Matriculation Year



Ben Kelsey (St Edmund Hall 2012), above and Sean Hopkins (Univ 2010), below manning the phones last summer.

CAREERS: MAKING THE MOST OF OUR GLOBAL CONNECTIONS

Offers for Alumni

The **University of Oxford Careers Service** continues to offer free advice and support after graduation. Alumni are welcome to attend careers events in Oxford, and arrange meetings with our specialist advisor, Dr Mike Moss (via Skype if convenient). Mike can advise on any stage of your career, whether you are looking for a new job, changing industry or going for promotion.

If you would like to participate in the programme offering our students an internship place, please contact Claire Grainger on **claire.grainger@earth.ox.ac.uk** or contact the Internship Office directly: **internships@careers.ox.ac.uk**

The online networking site Linkedin provides a wealth of opportunity to connect with people who you might wish to work for, or with. The Department has an alumni group with membership managed by the Alumni Office, where you can post jobs or ask for advice from fellow Oxford Earth Scientists around the world:
www.linkedin.com/grp/home?gid=3379392
If you have not yet set up a Linkedin Career Profile, simply take your latest CV and convert it via the online form, then start adding your connections: fellow alumni, former lecturers, colleagues and more.

Offers by Alumni

Oxford Careers Network (OCN)
The OCN is run by the Oxford University Careers Service to connect alumni as mentors to Oxford students, to help inform their careers choices and action they need to take to prepare for life beyond their degree. By providing some basic information about their current role and career path our alumni provide current students with valuable insights into their company or occupation. If you are interested in volunteering for this this highly-valued resource, please visit:
www.careers.ox.ac.uk/join-the-oxford-careers-network

Oxford University Internship Programme (OUIP)
One of the challenges of educating students in the 21st century is connecting them with the global workplace. The Internship Programme was created to provide our students with an international experience, and as a bridge between their studies and the start of their career.

90% of our internships are offered by Oxford alumni, and we are always looking for more opportunities for our students. Although every intern will have a unique experience, the internships offered should comprise the following common elements:


Jacob Morgan takes a break during his internship in Rio.


Yuqian Gan during her Perm State internship.

- Full-time work for 4-12 weeks during the summer vacation
- A defined project, which creates real value for the sponsoring organisation and a valuable learning experience for the student
- Interaction with an assigned supervisor or mentor within the sponsoring organisation
- A stipend, or some assistance with travel or accommodation
- Payment at the national minimal wage or better, if the internship is in the UK, and in the for-profit sector
- An international experience or access to an internship placement in the UK that is not readily available through alternative internship programmes.

If you would like to participate in the programme offering our students an internship place, please contact the Internship Office: internships@careers.ox.ac.uk

"The intership with Perm State University in OUIP programme offered me a great opportunity for geology practice and cultural experience. The part I really liked was the diversity of the activities. While mainly focusing on geophysics work, we also examined Permian limestones and developed a feel for the botany and ecology of the Perm Region. The International Summer School enabled us to make friends from other parts of the world. Also, we had the chance to have the most authentic Russian experience. It provided me with insight into the sort of things that a research university does on a day-to-day basis and enriched my practical skills." Yuqian Gan, 4th year (Univ 2012)

"I had a great time at the Brazilian National Institute for Space Research with just the right balance of work and play! The research I did into the Medieval Climate Anomaly and the Little Ice Age was fascinating as it is an area of climate history that I had not focussed on in lecture courses or tutorials before. The staff at INPE were extremely accommodating and friendly and went beyond their obligations to help us enjoy our time in Brazil."
Jacob Morgan, 4th Year (Univ 2012)

Charis Horn (St Anne's 2012) worked for the OU Museum of Natural History for a summer. Find out more about her experience in her blog entries: http://morethanadodo.com/2015/08/13/striking-gold/

MARTIN D. BRASIER (1947 – 2014)

Excerpt from obituary by Owen Green, Derek Siveter, and David Wacey (Worcester 1995).
Full text on Departmental website: www.earth.ox.ac.uk

Martin David Brasier was one of the country's leading palaeobiologists, emeritus Professor of Palaeobiology and fellow at St Edmund Hall. He tragically met his death in a car accident on the 16th December, 2014.

His research interests were extremely wide, temporally encompassing the entire geological column, and geographically all continents with the exception of Antarctica. However, he was probably best known for his research on the early biosphere, from the origin of life itself to the emergence in the fossil record of multi-celled animals during the so-called Cambrian Explosion.

Martin moved from Hull to Oxford in 1988. His relocation, part of the re-organization of departments during the national Earth Sciences Review, established a dedicated palaeobiology research laboratory in the basement of 10 Parks Road. New geochemical technologies enabled high-resolution contextual analysis of fossils that characterized the Ediacaran and Cambrian evolutionary radiations.

Martin pioneered a new, critical approach to the assessment of Earth's most ancient life, including both microfossils and trace fossils. Those present will never forget Martin's clear reasoning and good humour during the initial debate on the Apex Chert in San Francisco at the NASA Ames conference of April 2002, when he argued against the notion of organic structures being present in that 3.460 Ma deposit. Martin was extremely proud of planting the seed of this paradigm shift in the recognition of artefacts previously considered biogenic in origin, and frequently referred to this as his most satisfying research project.

In 2014, Martin was awarded the prestigious Lyell Medal from the Geological Society of London. Upon retirement in September 2014, his career was celebrated in Oxford with a day of talks in the department attended by colleagues, friends and family. Martin was ready to open a new chapter in his life, with exciting new avenues of research, now unfortunately lost to us.

At St Edmund Hall, Martin was responsible for the College paintings and Reserve Dean of Degrees, by virtue of his knowledge of Latin. Martin had many diverse talents and interests including piano, archaeology, and the history of science. His nurturing and kind nature was extended to the many students he taught and the post-doctoral colleagues he mentored and with whom he collaborated. In this, and a publication record of over 180 papers and his books, he leaves a substantial scientific legacy, and his intellectual spirit lives on in the work of his 'research family'.

Martin was a great family man and he had a knack for coinciding family holidays with geological fieldwork. His son Alexander is now a lecturer in geology at the University of Aberdeen. He will be very much missed by all who knew him. He is survived by his wife Cecilia, his sons Matthew and Alexander, daughter Zoe and two grandchildren.

Martin with his research family during his retirement conference in September 2014

Talks recorded during the September 2014 symposium "Evolution and Early Life: a Celebration of the Career of Martin Brasier on his Retirement" are available via the Palaeocast website: http://www.palaeocast.com/evolution-and-early-life. This includes a talk given by Martin and his narration of the geological collection displayed on that day. We are very grateful to Palaeocast for making these recordings available.

ERIC J. W. WHITTAKER (1921- 2015)

By Paul Henderson (Keble 1963)

Eric James William Whittaker, distinguished crystallographer, mineralogist and geochemist, died on Thursday 2 July 2015 in Kidlington, Oxfordshire, after a short illness. Born on 1 November 1921, he attended Stockport Grammar School and Derby School, and took his BA degree (1943) in Chemistry at Magdalen College Oxford. Influenced by the war effort, Eric's undergraduate research project used X-ray methods to investigate the structure of phases within the charcoal used in gas masks.

Eric joined the brake-lining manufacturer Ferodo UK, researching the structure of amphiboles and related minerals, earning a doctorate from the University of London in 1957. Promotion in 1963 took him away from his favoured research, and so he resigned to take up the lectureship in geochemistry at Oxford. He arrived in 1965 with exceptional experience in structural crystallography, and an established reputation as an authority on the structure of asbestiform minerals.

Oxford gave him opportunities to work with new colleagues, students and methods, as well as to develop the postgraduate course for the Diploma in Geochemistry. When Jack Zussman moved to the Professorship of Geology at Manchester University in 1967, Eric became Reader in Mineralogy until he retired in 1983. Amphiboles remained his principal focus, working with colleagues including Barbara Cressey and John Hutchison on important topics such as the accommodation of defects and disturbances, the termination of lamellae, and the role of twinning within their structures. He also brought innovative approaches to other subjects such as silicate liquid structures and the application of ionic radii for use in geochemistry. Twice (1977 and 1978) he and his co-author Fred Wicks, received the annual Hawley medal of the Mineralogical Association of Canada for the best paper in their journal, on serpentine structures and textures.

Eric was admired for his systematic and logical approach. His clarity of thought could be daunting, but it was always tempered by his gentle humour and infectious laugh. His 1981 text book Crystallography: An Introduction for Earth Science (and other Solid State) Students has a special elegance through its logical emphasis on the repeating pattern of atoms. He was a valuable member of the International Mineralogical Association's committee on the nomenclature of amphiboles and his renown led to the amphibole Whittakerite being named after him.

Eric was a fellow at St Cross College from 1967 and Vice-Master from 1979 to 1982. He made a substantial contribution during the College's expansion and move to its new site in St Giles.

Eric enjoyed painting, and ancient cultures and hieroglyphics. He published An Atlas of Hyperstereograms of the Four-Dimensional Crystal Classes (OUP, 1985) and became fascinated by Penrose patterns and their relationship to higher dimensional lattices. He was delighted to be made an Honorary Life Fellow of the Mineralogical Society in 2010.

He is survived by his two sons Anthony and Roger. His wife, Dorothy, for many years the Departmental Librarian, predeceased him. He is remembered with considerable affection by many colleagues and students especially for his invaluable help, encouragement and genuine interest.

Eric admiring the photography of the late David Vincent, with Jack Zussman, Diana Relton and David's daughter Polly (L)

ALUMNI EVENTS

Over the past year or so we have welcomed over 100 Earth Science alumni to our various events, some returning for more than one, which is always great to see. Many have organised year group reunions to celebrate significant milestones since matriculation or graduation. We present a brief overview of past events:

Don Porcelli with Nikita Lobanov-Rostovsky (Christ Church 1955) and the speaker, Alessandro Morbidelli.

Lobanov-Rostovsky Lecture in Planetary Geology
Friday 28th November 2014

The Lobanov-Rostovsky Lecture in Planetary Geology, entitled **"The formation of terrestrial planets,"** was given by Alessandro Morbidelli of the Observatoire de la Cote d'Azur in Nice.

This was the second of our annual public lecture series in planetary geology held in collaboration with the Physics Department, to which all our alumni and interested guests are invited. The lectures in this annual series are recorded and made available after the event. Find out more about the series online: **www.alumniweb.ox.ac.uk/earth/lobanov-rostovsky-lecture**

Professor Ray Pierrehumbert, who recently relocated from Chicago to the University of Oxford's Department of Physics, will give the third annual Lobanov-Rostovsky lecture on 27th May 2016.

London Panel Discussion - Thursday 12th February 2015
"Opportunities and Responsibilities: Earth Sciences in the Developing World"

Alumni, guests and fellow researchers gathered in the Royal Society to discuss how universities such as Oxford might work with and in nations in the developing world.

Our panellists provided thoughtful suggestions for engagement in this area: **Professor Tamsin Mather** is a volcanologist in the Department, and one of the lead members of STREVA, a project dedicated to improving outcomes for people who live in areas of volcanic activity. They work directly with local researchers and government officials to develop and apply a practical and adaptable volcanic risk assessment framework which can be used to generate plans that will reduce the negative consequences of volcanic activity on people and assets.

Dr Mike Daly joined the Department as a Visiting Professor in 2013. Formerly Executive Vice President of Exploration at BP, Mike brings hands-on experience and invaluable industry contacts to a host of new research projects, including some at DPhil level as part of the NERC Oil and Gas Centre for Doctoral Training (CDT). Funded by NERC and backed by a consortium of industrial partners, the CDT offers cutting-edge, industry-standard research projects.

Sir Richard Gozney, KCMG CVO has held various diplomatic appointments, including Governor of Bermuda, British High Commissioner to Nigeria and British Ambassador to Indonesia. He has recently been appointed Lieutenant Governor of the Isle of Man. Sir Richard brought unique insight into the complexities of working with governments in the developing world.

Dr Nick Gardiner, Postdoctoral Researcher in Economic Geology and Tectonics, has worked extensively on tin mineralisation in Myanmar. His experiences in the region were documented in a previous edition of this magazine.

Alumni Dinner
Saturday 16th May 2015

The 2015 Alumni Dinner was held at St Cross College, home to Faculty members Barry Parsons, Dave Waters, Helen Johnson and Stuart Robinson, as well as Museum Faculty Derek Siveter and David Legg. The matriculation classes of 2009, 2005 and 1989 took the opportunity to gather for reunions, ensuring a remarkably young average age for such an event.

Earlier in the afternoon, alumni were able to tour the department's teaching and research facilities, as well as the museum's Smith archives, in a private tour led by Professor Paul Smith, Director of OUMNH, to celebrate 200 years of the William Smith geological map of Great Britain. Professor Barry Parsons gave a talk on *"Observing Earthquakes from Space: Science and Hazard,"* which included insight into the earthquake in Nepal.

Class of 1972-75 Reunion
Friday 7th August 2015

Bruce Levell (St Catz 1972, and now a Visiting Professor in the department) organised his year group's reunion, to celebrate 40 years since graduation. Attendees from the US and Australia enjoyed a tour of the department and museum, a sneak peek into the old building, followed by dinner at Lady Margaret Hall. The day was made even more complete by fine weather and special appearances by former lecturers Keith O'Nions, Harold Reading and Jim Kennedy.

Meeting Minds: Alumni Weekend in Oxford
Saturday 19th September 2015

Professor Chris Ballentine spoke on the topic of *"Ancient Water: A hiding place for life over planetary timescales."* Chris has been exploring ancient rocks deep in the Earth's crust, which have been found to produce much more hydrogen gas than

Class of 1972-75 Reunion

The Class of 1972 outside our former building, the Robert Hooke.

Professor Sir Keith O'Nions gives an impromptu lecture on mass spectroscopy.

Harold Reading joined the reunion for afternoon tea.

previously thought — a situation on a par with conditions near hydrothermal vents, which host thriving ecosystems. Scientists once thought that such subsurface microbial ecosystems consumed energy that filtered down from the Earth's surface, implying that such ecosystems ultimately depended on sunlight and photosynthesis. Chris explained how the discovery of such ecosystems provides a road map with which to search for deep microbial life on Earth and possibly Mars.

Class of 1987-1990 Reunion Saturday 19th September 2015

Jo Fleming (Hertford 1987) organised a reunion for those who matriculated in 1987. The group met in the Department, where they had a brief tour of the teaching facilities, and attended Chris Ballentine's talk (see above) and drinks reception, before repairing to a local restaurant.

Earth Sciences Careers Fair Friday 23rd October 2015

Our annual careers event allows us to connect with alumni in companies and industries reliant on the next generation of earth scientists, whilst also providing a showcase for our students who wish to know more about the career options available to them. This year we were delighted to welcome alumni representing Atkins, BP, Cairn Energy, EcoVeritas, Elsevier and ERC Equipoise, as well as academic options represented by Anna Bidgood (Oxford DPhil) and Susanna Ebmeier (PDRA at Bristol).

The Class of 1987 on the roof of the Earth Sciences Building, South Parks Road. Jo Fleming centre.

If you are interested in attending next year, please contact the Alumni Office or call Claire Grainger on +44 (0) 1865 272031. We are particularly interested in representing niche areas of industry, which might not get much promotion, for example environmental consultants in the retail sector, hydrogeologists in engineering companies, or geoscience roles in the third sector. Employers do not have to have a current vacancy to be eligible to attend.

London Networking Event Thursday 11th February 2016, The Old Bank of England

Univ tutor Lars Hansen gave a brief talk on aspects of his research into rock rheology, illustrated by the pattern of bubbles in a glass of beer, ketchup on chips, and the forces inherent in velcro and bubble wrap, to alumni gathered in the Old Bank of England on Fleet Street.

Univ Geologists 40th Reunion Thursday 24th March 2016

Univ Geologists who matriculated in 1975 enjoyed a reunion weekend in Oxford on Thursday 24th March. The visit, organised by Andrew McCormick, included a tour of the department, drinks at Happy Hour in our rooftop common room, dinner in Univ, and breakfast with Professor David Bell on the Sunday.

Forthcoming Alumni Events

As we go to press, we are almost upon the first two events, which are booking up quickly:

Lobanov-Rostovsky Lecture in Planetary Geology 27th May 2016

Professor Ray Pierrehumbert, who recently moved from Chicago to the Physics department here in Oxford, will give the third Lobanov-Rostovsky lecture on 27th May 2016.

Alumni Dinner 28th May 2016

The 2016 dinner will be held at St Anne's College, preceded by a Graveyard Geology tour, and a talk on the 1966 Greenland Expedition by Prof David Bell.

Class of 1993 Reunion Saturday 9th July 2016

Earth Scientists who matriculated in 1993 plan to celebrate 20 years since graduation with a reunion in Oxford! Esther Chambers is organising this event.

Alumni Weekend Saturday 17th September 2016

Oceanographers Helen Johnson and Heather Bouman explain how their very different approaches –physics and biogeochemistry - combine to give us a greater understanding of the oceans, and what they can tell us about climate change over long and short time-scales. Booking for this event will be via the Alumni Weekend registration.

Watts-Fest Monday 19th September 2016

The career of Professor Tony Watts is to be celebrated in a symposium at OUMNH. Alumni are welcome to attend the day, and the drinks reception afterwards.

Details of all forthcoming alumni events, as well as reports and photos from past events, are on our website: www.alumniweb.ox.ac.uk/earth/events

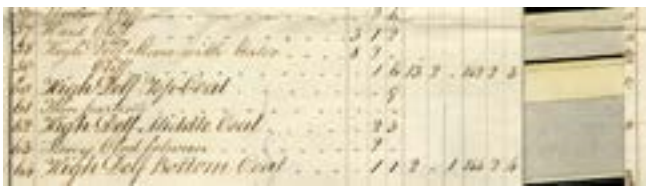
HANDWRITTEN IN STONE: HOW WILLIAM SMITH AND HIS MAPS CHANGED GEOLOGY

Two hundred years ago William Smith published the first geological map of England and Wales, a beautiful and ground-breaking piece of work which remains important to this day. Celebrating the bicentenary of this publication, the Oxford University Museum of Natural History devoted much of the top gallery to an exhibition entitled *'Handwritten in Stone'*, which ran from October 2015 to January 2016. The exhibition drew on the largest archive of Smith material in the world and presented an intimate portrait of the extraordinary life and work of the 'father of geology'.

Alongside the famous 1815 map itself, excerpts from Smith's personal papers, drawings, publications, maps and geological sections were publicly displayed for the first time, together with fossil material from the Museum's collections. The displays included the oldest geological map in the world, Smith's 1799 map of Bath, as well as up-to-the-minute video interviews with modern-day geologists.

Born in Churchill in Oxfordshire, on 23 March, 1769, Smith conceived his geological theories and created the first stratigraphic maps single-handedly. He was the first child of the village blacksmith, John Smith (1735-1777) and his wife Ann Smith (1745-1807). William attended the local school until the age of 11, receiving the only formal education he ever would. After his mother remarried William began work for his uncle, also named William Smith. It was then that he began to learn practical skills in agriculture and civil engineering. It was also at this very young age that William began developing his fascination with the landscape of the country around him and the earth beneath him. His story – with its dramatic highs and lows – was brought to a wider audience in 2001 with the publication of Simon Winchester's *The Map that Changed the World*. As part of the public programme for Handwritten in Stone, Simon gave a talk at the Museum in October.

As well as the historical story of Smith and his maps, the exhibition highlighted the ongoing legacy of his work, showing how his approach to mapping remains in use today. In a lecture at the Museum in November, Professor Mike Searle revealed how he has used Smith's techniques to map the Himalaya, combining field mapping with modern approaches. Much of Smith's archive has now been digitised and can be viewed online at www.williamsmithonline.com.



Above: Detail from Smith's mapping notes.
Right: Smith's 1815 map

NEWS & EVENTS


Matt Friedman


Juliet Biggs and Tasmin Mather


Wemu Xu


Richard Katz


Richard Walker


Nick Tosca


Receiving silver in Green Impact

November 2014: DPhil alumni Juliet Biggs (Univ 2003) and Susanna Ebmeier (Linacre 2012), now at the University of Bristol) and Tamsin Mather awarded Science of Risk Prize by Lloyd's for Nature Communications paper on volcanoes.

December 2014: GeoPRISMS AGU Student Prize - Honourable Mention for Will Hutchison (St Edmund Hall 2007)

January 2015: Mike Stock (Worcester 2012) won the Bob Hunter Prize for the best student oral presentation at the VMSG Annual Meeting

February 2015: Jack Matthews (St Peters 2007) awarded McKerrow Cup at the Oxford Geology Group's Young Geoscientist of the Year Competition

March 2015: Brendan Dyck (Univ 2012) awarded the Metamorphic Studies Group 'Journal of Petrology Prize' for the best student presentation

April 2015: Mike Searle elected Foreign Fellow of the Pakistan Academy of Sciences

April 2015: Nick Tosca awarded the Mineralogical Society of America Award

May 2015: Alex Halliday awarded Oxburgh Medal by Institute of Measurement and Control and elected Foreign Associate of the US National Academy of Sciences

June 2015: Hugh Jenkyns elected Foreign Member of Lombard Institute

June 2015: Earth Sciences awarded Silver in Green Impact scheme for Department and Labs

July 2015: Weimu Xu awarded the prize for best student oral contribution during the Conference "Climates of the past - lessons for the future"

August 2015: New Professors - Matt Friedman, Richard Katz and Richard Walker

October 2015: Karin Sigloch and Nick Tosca receive Leverhulme Prizes

January 2016: David Pyle named Mineralogical Society Hallimond Lecturer

Feb 2016: Tamsin Mather named Mineralogical Society Distinguished Lecturer

Feb 2016: Philip England awarded Gold Medal for Geophysics by Royal Astronomical Society

LEGACY GIFTS HELP ENSURE THE DEPARTMENT ENDURES AND EVOLVES.

To learn more about the impact a gift in your will could have, or to find out how to remember the Department's work in your bequest, please contact:

The Alumni Relations Officer, Department of Earth Sciences, South Parks Road, Oxford OX1 3AN
Email: alumni@earth.ox.ac.uk Call: +44 (01865) 429448

EARTHSCIENCES

UNIVERSITY OF OXFORD