The University of Oxford
Department of Earth Sciences

earth sciences news

Michaelmas 2011

issue no 02

in this issue:

UNIVERSITY OF OXFORD

Introduction by Professor John Woodhouse Head of Department

Welcome to this year's edition of Earth Sciences News. In January I took over from Philip England as Head of Department. Philip has decided to step down to have more time to do science and we should thank and congratulate Philip on his achievements on behalf of the Department. His term as Head has seen the Department develop in many new directions and has culminated in the completion of the splendid new building; as incoming Head it will be a challenge to maintain the leadership and forward momentum that Philip has provided.

The move to the new building went surprisingly smoothly and we owe huge thanks to the dedicated staff and students that showed such devotion to making things work during the transition period.

In May the building was officially opened with two events; one involving dignitaries from Oxford and elsewhere, and another where the whole Department community celebrated into the early hours! Those of you that have visited the new building will know that alongside its imaginative design it boasts an atmosphere of creativity and expansiveness that contributes to our goal of excellence in teaching and research. We are delighted that the building has received nominations for prestigious architectural and engineering awards.

The Department's cutting edge research programmes continue to generate exciting new science; examples are provided later in this newsletter in an interview with Alistair White and an article by Dr Richard Walker. Alistair describes how mineral deposits can be further understood through comprehensive laboratory and field studies and Richard uses a wide range of observations, both physical and geological, to discover how the Asian continent is deforming, leading to a better assessment of earthquake risk. I am delighted to announce that Richard has been appointed to a University Lectureship and Tutorial Fellowship at St Edmund Hall, starting at the end of his current Royal Society University Research Fellowship.

This academic year will see the completion of the 'rolling out' of a new undergraduate course; we have strengthened grounding in the basic sciences while fully maintaining and modernising the lecture courses and the field and practical programmes. Fieldwork remains central in the undergraduate course and Oxford is now one of the very few great universities in the world to maintain a serious commitment to field training. However, we are not immune from the pressures that have caused the decline in field teaching elsewhere, and, on behalf of the Department, I would like to thank all of our supporters who generously contribute towards these costs.

Throughout this year the Department has enjoyed hosting a number of alumni events that have enabled many of you to maintain or to renew your links with us; we are now in contact with a staggering 1600 former students! I look forward to meeting many more new faces this year, for information on forthcoming events please do visit **www.earth.ox.ac.uk/alumni**.

Guests enjoying a reception in the Earth Sciences Atrium

above: Lord Rees of Ludlow (far left) and the Vice-Chancellor, Professor Andrew Hamilton (second from the left) at the Official Opening of the new building.

below: Guests being shown the Nu1700 mass spectrometer by Dr Nick Belshaw.

Department News

Official Opening of the new building

The new Earth Sciences building was officially opened by Lord Rees of Ludlow on Thursday 5 May 2011. We were delighted that Gwenna Roberts was able to join us, representing The Gareth and Gwenna Roberts Foundation. Other guests at the opening included the Vice-Chancellor Professor Andrew Hamilton FRS, the Head of the Mathematical, Physical and Life Sciences Division Professor Alex Halliday FRS, and other supporters and collaborators from across the Collegiate University.
Following tours of the building and the official opening ceremony, guests were entertained by the Hildegard Choir during the reception.

Tectonics: A building for Earth Sciences at Oxford

Tectonics is a term that appears in the lexicon of both Earth Sciences and architecture, and is therefore a fitting title for this book documenting the design and construction of the Department's new building. Due to be published in September 2011, the book will tell the story of the building from its early commissioning through to its occupation and includes contextual essays by many of the individuals involved in its development, including Philip England, Steve Hesselbo and the architects at Wilkinson Eyre.

For more information please visit http://blackdogonline.com/all-books/tectonics.html

Black Dog Publishing
ISBN 978 1 907317 53 8

Constructors awards

We are pleased to announce that Pell Frischmann have won a 2011 Engineering Excellence Award for their work on the new building, and that Laing O'Rourke won Gold at the 2011 Considerate Constructors Scheme National Site Awards.

Retirement of Derek Preston

After many years of working in the Department, Derek Preston retired in early April 2011. A gathering of both colleagues and friends took place on Tuesday 5 April to send him off in style.

Prizes and awards for Earth Sciences research

1. **Dr Tamsin Mather** is one of five Oxford academics who have been awarded a **Leverhulme Prize** for outstanding contributions in their field of research. The £70,000 prize is awarded to younger scholars who have already made a substantial contribution to their particular field of study.

2. **Dr Richard Walker** has been awarded the **Oman-Thesiger Fellowship** from the Royal Geographical Society. The annual fellowship reflects Thesiger's interests in the peoples and environments of the desert. It focuses either on the physical aspects or on the human dimension of arid environments. The fellowship funds a researcher with an outstanding research proposal, including periods of arid environment fieldwork, usually within the Middle East and other arid regions visited by Wilfred Thesiger.

3. **Professor Barry Parsons** has been elected a **Fellow of the American Geophysical Union**. This honour recognizes those who have made exceptional contributions and have attained acknowledged eminence in the Earth and Space sciences.

4. **Professor David Pyle** was a zone winner in the science engagement activity **'I'm a Scientist..'**, organised by the National Environment Research Council. Described as an online forum interacting with school children, David answered over 600 questions and typed his way through 12 hours of live web chat in 2 weeks. As a zone winner, David received £500 to spend on a science communication project, and plans to produce some podcasts from live volcanoes.

5. **Richard Walters** has been awarded a **Media Fellowship** by the British Science Association, and also received the runner-up prize in the Natural Hazards category of the Lloyd's Science of Risk competition.

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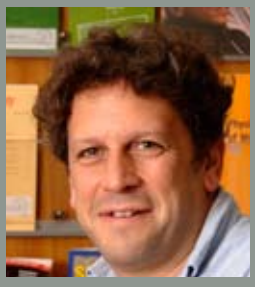


5.

Earth Sciences 'Wows' them all!

by Dr Kate Donovan

During this year's Science Week a lively group of Earth Scientists wowed over 3000 people with an interactive stand, live demonstrations and lots more!

The Department of Earth Sciences Wow! How? team and exhibit.

Each year hundreds of families come to marvel at the live experiments and interactive exhibits run by Oxford University staff and students. The Wow!How? event takes place in the University's Natural History Museum and this year on 12th March, the Department produced a breathtaking exhibit entitled the Disaster Zone.

Jeannie Scott, Phil Holdship, Alistair White, Kate Donovan, Michelle Parks and Adam Robinson took on the challenge to enthuse and educate the public about our exciting planet and the hazards we face.

The Disaster Zone stole the show with rock samples, microscopes, a seismograph, earthquake recreations, tornado makers, a protective volcano suit, incredible videos and exciting posters.

"It was a great day, we just couldn't believe how excited the kids were, and some just kept coming back again and again."

"Today was fantastic, but how can we top this next year?"

A live feed from a global seismic monitor intrigued the adults, whilst children were challenged to build earthquake-proof houses. They even got to create mini tremors and monitor them through our very own digital seismograph. After this they marvelled at rock samples from around the world and examined them in detail down the microscope. Finally, children and adults had the chance to experience the weight and heat of the volcano sampling suit kindly donated by Prof David Pyle.

"Wow! I never knew that's what rocks are made of, they are so beautiful!"

Throughout the day the team also ran live demonstrations called 'Build a Volcano'. With help from hundreds of young people the team took turns in creating giant volcano cakes. Each volcanic hazard was recreated in edible form, with ice cream wafers representing pyroclastic flow deposits, popcorn for ballistic projectiles and strawberry syrup for basaltic lava.

"And that is why pyroclastic flows are so dangerous! Now, who wants a slice of volcano?"

Photograph by John Elliott.

With over 3000 visitors in just one day the team did a valiant job at fielding questions, running activities and inspiring the next generation of Earth Scientists.

Moving the Earth Sciences Library

by Elizabeth Crowley,
Earth Sciences Librarian

It is not often that a librarian has the opportunity to move an entire library – renovations may take place, collections may be added and libraries may be merged, but to move a whole library is rare. When I took over in the summer of 2010 from the much loved and very experienced Earth Sciences Librarian Jenny Colls, my first task (besides learning how the job worked in a new environment) was to plan for the move to the new building.

I started with a tour of the concrete shell. I looked at plans and obtained figures. It became clear that there was not as much shelving in the new library as in the old, and so my first task was to work on a proposal for disposing of some of the library's collection.

It is always a challenge to decide what to dispose of and these decisions were made more manageable with advice from both the library committee and staff of the department. It was also helpful to know the Radcliffe Science Library was close at hand; a number of items were re-housed there and only duplicate material was marked for disposal. Some material was taken by the University Museum and a vast amount was sent to Africa.

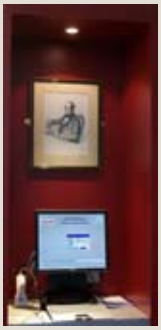
Once everything had been sorted, it was then possible to think about where to place the books, journals and maps that remained. I knew there were 220 linear metres of shelving in the new library and I had measurements for each section or journal run. I also knew that there was some space in the basement storage area. With a basic grasp of what material was highly used and a knowledge of which journal runs were no longer being added to I was in a position to make some decisions.

One sunny Saturday afternoon last August I sat at my dining table with a sheaf of papers covered in measurements, several photocopied plans of the new library and a calculator. It took a couple of hours and lots of scribbling to work out a way for the sections to run around the room as logically as possible and fit into the space, leaving room for growth. Back in the old library I numbered each section and drew up a packing list.

On Monday 13 September the move began at 8am, and the books and journals were packed into metre long crates. The packing list worked like a dream and by Friday lunchtime the last book was off the shelves of the old library. Unfortunately, things did not go as smoothly at the other end – not all of the shelving had been built! And, as my desk had not been built either, I did not have a computer and could not crack on with the less visible side of a library move – the changes to the catalogue. However, it all came together in the end and it was possible to open the library on the 15th October.

This summer the changes in the library were more technological; a new Integrated Library System was implemented throughout all of the libraries of Oxford University. At 5pm on the 8th July the library catalogue, OLIS, which had been in use since 1996, ceased to exist. All of the data had to be migrated to the new system and, as a result, circulation and the stack request functions were not available for two weeks. On the 22nd July the new system went live, and from now on all searching (and stack request functions for the Bodleian Libraries) will take place via SOLO, which has enhanced functionality such as searching for material in an individual library and the E-Shelf where bibliographic details of items of interest can be collected.

If you are an alumnus/a of the University, please do feel free to visit the library here in the new Earth Sciences building and do not forget that you can use the Bodleian Libraries too.



Interview with.... Alistair White

Alistair White is a third year D.Phil student working with Dave Waters and Laurence Robb as part of the 'hard rock group'. The group's broad research focus is in petrology, regional tectonics and economic geology. They use petrographic observations, mineral and whole-rock geochemistry, geochronology and increasingly, thermodynamic modelling to understand the metamorphic, tectonic and/or hydrothermal history of a region. The group is fairly small within the department, with four D.Phil students out of the fifty or so postgraduates.

Lima Pit, Ghana

Here Alistair speaks to Hannah Jackson about his research.

What does your D.Phil focus on?

My D.Phil has been looking into a somewhat unique hydrothermal gold deposit in South West Ghana and trying to relate it to the regional tectonic and metallogenic framework of the region. The deposit has received relatively little academic attention in the past so my project started with the basics; a petrographic and geochemical characterization of the lithologies and the mineralisation. I have been using a range of geochronological techniques - to place absolute time constraints on the various metamorphic, igneous and hydrothermal events - along with thermodynamic modelling of the metamorphic and hydrothermal mineral assemblages - to determine pressure-temperature conditions of these events - to build a tectonic model for the deposit. Finally, I have been developing the use of portable infrared spectrometry as a cheap, efficient and more environmentally friendly exploration tool in heavily vegetated terrains. I am pleased to report that all of this is going well, for this week at least!

How do you split your time between the lab and field?

My work involves a fair amount of time in the field and over the three years of my D.Phil I have spent about five months out in Ghana. I typically go out for a month or two at a time where I mainly log and sample drill cores and map the pits. These primary field observations are vital for studies such as mine as they provide both a context and absolute constraints on the analysis and interpretations carried out in the lab. Field work has always been one of my favourite parts of geology (in no small part due to my undergraduate trips) and travelling to Ghana has been no exception. Working on an operating mine in the middle of the Ghanaian rainforest has been a great experience and I sometimes revert to a seven year old when the giant dump trucks rumble past. Throughout my D.Phil it has also been fascinating to see how early stage exploration develops into economic production. Back in Oxford I spend most of my time working at the thin section scale making petrographic observations or analysing mineral compositions with the SEM (Scanning Electron Microscope), which provides the input data for the thermodynamic modelling.

This sounds academically interesting, but could you speculate on the economic and social impact of your research?

Of course it's obvious that there is an industrial application to this sort of research and economic gain is often an additional driving force behind such studies. With the price of gold at an all time high; the demand for other commodities recovering rapidly after the global financial crisis, and political issues surrounding the production and distribution of certain metals, there is a new boom in ore deposit research. Generally speaking, the more we understand about how ore deposits form, the more effective our exploration and production efforts will be. This is opening up exciting avenues for links with industrial partners. I am wholly sponsored by Gold Fields Ltd., an international gold mining company with active operations and exploration projects on six continents, who have been extremely supportive of my research. Similarly, these links are providing opportunities for fantastic 4th year undergraduate projects where, in particular, they are facilitating all important field work. Since 2007 4th year students carrying out economic geology projects have had the opportunity to undertake field work all across the world, including Zambia, Ghana, Burkina Faso, South Africa and Nigeria (we have definitely developed an African focus), all directly involved with industrial partners. This year, two of our group's undergraduates will be spending their summer in Australia and Ethiopia. Given the current state of research funding in the UK, this collaboration between academia and industry is more mutually beneficial than ever.

Life in the deserts of Iran:

Active faults landscape, and a study of the Dasht-e-Bayaz earthquakes

by Dr Richard Walker

Dr Richard Walker is a Royal Society University Research Fellow who has worked on the study of earthquakes in Iran. Below, he describes some of his recent work at Dasht-e-Bayaz in the northeast of the country. The fieldwork was supported by the Royal Geographical Society through the award of its Oman-Thesiger International Fellowship in 2011.

Eastern Iran is a land of high mountains surrounded by inhospitable desert depressions. It also holds the dubious honour of hosting the world's hottest place: the aptly named 'plain of roasted wheat' in the Dasht-e-Lut, which itself translates as 'the desert of Hell'.

Despite the harsh climate, the region is inhabited but because of the aridity, most of the population is forced to inhabit relatively narrow fringes of land flanked by high mountains on the one side and by barren desert on the other. Even at the desert margins the rivers are dry except during rare floods. Agriculture relies on the tapping and distribution of scarce groundwater supplies by networks of underground canals known as qanats: an innovative technology that was first developed about 4,000 years ago, and whose presence can be inferred from the lines of craters that track across the surface. Indeed, every aspect of life in the desert is tuned to coping with the limitations imposed by the arid climate, from the traditional engineering of 'wind towers' to catch the breeze and bring natural air conditioning to interiors, to the design of lush gardens in the desert with fountains fed solely by qanat water.

But the harsh climate is not the only hazard faced by the people of eastern Iran, as the region is also one of the most seismically active parts of the continents. The mountain ranges of Iran are there because of the continental collision of Arabia and Asia, and they continue to grow due to slip on active faults in earthquakes. The relative motions between continents, rather than being confined to very narrow plate boundary zones as they are in the oceans, are accommodated on many active structures that are widely distributed across regions that can be thousands of kilometres across. This distributed behaviour has implications for assessing seismic hazard in places like Iran, as it means that much of the country is at risk from earthquakes. The many simultaneously active faults are accumulating strain relatively slowly, and therefore they can be difficult to identify. One of the motivations of our research in Iran is to try to overcome these problems in order to better understand the deformation of the crust in a continental collision zone, in addition to aiding assessments of earthquake hazard.

Meeting one of the local inhabitants!

Hiking into the mountains to follow the 1968 Dasht-e-Bayaz earthquake rupture

Earthquakes can, and do, hit hard in Iran. One example occurred in the desert community of Dasht-e-Bayaz, which was struck by a magnitude 7.1 earthquake on the 31 August 1968, killing an estimated 7,000 to 12,000 people: a sizeable fraction of the total population in this rural region. The earthquake was caused by rupture of the western 80 km of the left-lateral Dasht-e-Bayaz fault, along which most of the villages in the region are sited. Since 1968 the Dasht-e-Bayaz region has been subject to numerous further destructive earthquakes, including four events of magnitude 5.5-6, four events of magnitude 6-7, and a further two events of magnitude greater than 7.

It is the sequence of eleven destructive earthquakes at Dasht-e-Bayaz that has led me to spend a considerable part of the past five years studying this small part of the world. Working with scientists from the Geological Survey of Iran, the Universities of Tehran and Birjand, and with a host of researchers from the UK and America, I have attempted to understand the role played by the Dasht-e-Bayaz fault in the regional tectonics and the future hazard that it might pose to the local inhabitants. Our work ranges from seismological investigation of the earthquakes themselves through to studies of the landscape of the Dasht-e-Bayaz region, which retains clues to the history (and prehistory) of slip events on the faults.

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The aftermath of the earthquake at Bam on the 26 December 2003

An important part of our work is to get into the field and to collect samples for dating landforms that have been displaced by measurable amounts across the active faults - a type of work that usually involves digging holes and then spending long periods of time standing in them! Our results suggest that the Dasht-e-Bayaz fault is storing strain at an average rate of just a few millimetres per year, but that it is just one of a population of many active faults - not all of which are known to have produced earthquakes in historic times.

The striking correlation between population centres and the distribution of earthquakes at Dasht-e-Bayaz is not unique. Indeed, as recognised by my colleague James Jackson at Cambridge University, many of the destructive earthquakes in the deserts of Iran appear to accurately target the rare towns and villages, such as at Bam where almost half the population of 80,000 was killed by a shock of magnitude 6.6 almost directly beneath the town on Boxing Day, 2003; or at the oasis of Tabas, which lost almost 80% of its population of 20,000 in an earthquake in September 1978.

Life in the deserts of Iran:

Active faults, landscape and a study of the Dasht-e-Bayaz earthquakes

The correlation between the location of destructive earthquakes and centres of population is explained by the restricted availability of water, which is closely associated with the distribution of active faults - both by the channelling of ground waters along faults to form springs, and by the production over geological time of large mountain ranges that collect snow in winter and possess water tables that are elevated with respect to surrounding lowlands: water tables that can then be tapped by qanat. The inescapable message is that if there were no faults, and hence no earthquakes, it would make habitation much more difficult, or even impossible, in these desert regions. The people hence live in a state of uneasy truce with the active faults, which provide a reliable year-round source of water, but which occasionally rupture causing shocking levels of destruction.

But it might not always have been this way. Despite being one of the hottest and most arid regions on Earth at present, the landscape of eastern Iran retains evidence that a much milder and wetter environment existed at times in the prehistoric past. Several of these clues come from our own research over the past few years, in which we have dated the sequence of river and lakebed deposition at sites across the region. Our results suggest that from 10,000 to at least 7,000 years before present there was a time of rapid evolution of the landscape; first with the deposition of large bodies of sediment in alluvial fans at the mountain range-fronts; and then by the incision by rivers of the fan surfaces to form deep canyons flanked by flights of river terraces abandoned as the rivers continued to cut downwards. The few dates from lakebed sediments suggest that the lakes were at their highest levels between 8,000 and 7,000 years ago. It therefore appears that the major changes in landscape occurred at a time when water was more abundant than at present. As we have not found any major landscape feature dating to less than 7,000 years, we infer that a dwindling supply of surface water has slowed evolution of the landscape.

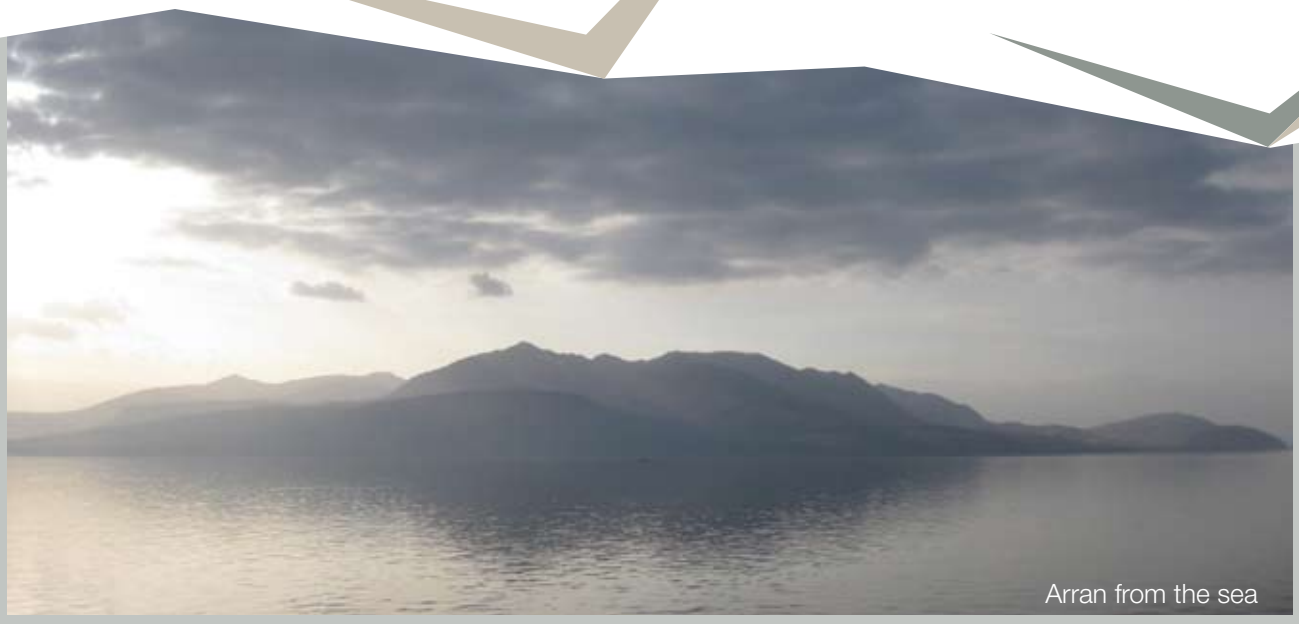
Our current aim is to continue our research into the factors that have shaped human habitation in the deserts of Iran. We are constructing records of past environmental change from the analysis of lakebed sediments and of cave carbonates to which we can compare our record of landscape change. The inhabitants of Dasht-e-Bayaz and the many other desert communities of Iran, face an uncertain future in an environment where even minor variations in the availability of water could have a large impact on their way of life. We hope that unravelling the history of both earthquake occurrence and of climatic change will help prepare for the future.

The Team

Article by
Dr Richard Walker

Arran Fieldtrip

by Fred Richards, 2nd-year undergraduate



Arran from the sea

Bright and early on a mid-April morning a bleary-eyed, motley crew of freshers embarked on the 10 hour slog up the M6 to Scotland: land of geology and abundant precipitation. Upon arrival in Arran, weary and drained from the journey, we poured out of the minibuses and into the rooms that would be our homes for the next ten days. By the time dinner had been eaten and the evening briefing had been attended, the prospect of the impending nine days of early wake-ups, long days in the field, and general effort was not particularly attractive. However, we were all pleasantly surprised with our time in Arran (and not just by the tans we acquired)!

There were lows - determining grain size of yet another non-descript grey (or red if you were lucky) rock grew a little tiresome - but they were far outweighed by the highs: beautiful sunshine, stunning landscape and inspired geology puns courtesy of Dr. Mac Niocaill ("one might even call this sandstone an "Arran"-ite" – cue groans). The mapping and general geologising, of course, took up large portions of our time; however the good humour and resourcefulness of the staff, in conjunction with the benevolence of the weather, made these tasks both enjoyable and interesting. Moments of hilarity punctuated each day's work whether it was Ben's insistence that he'd seen a mountain crab, or Ed having to be physically restrained from hammering Hutton's Unconformity.

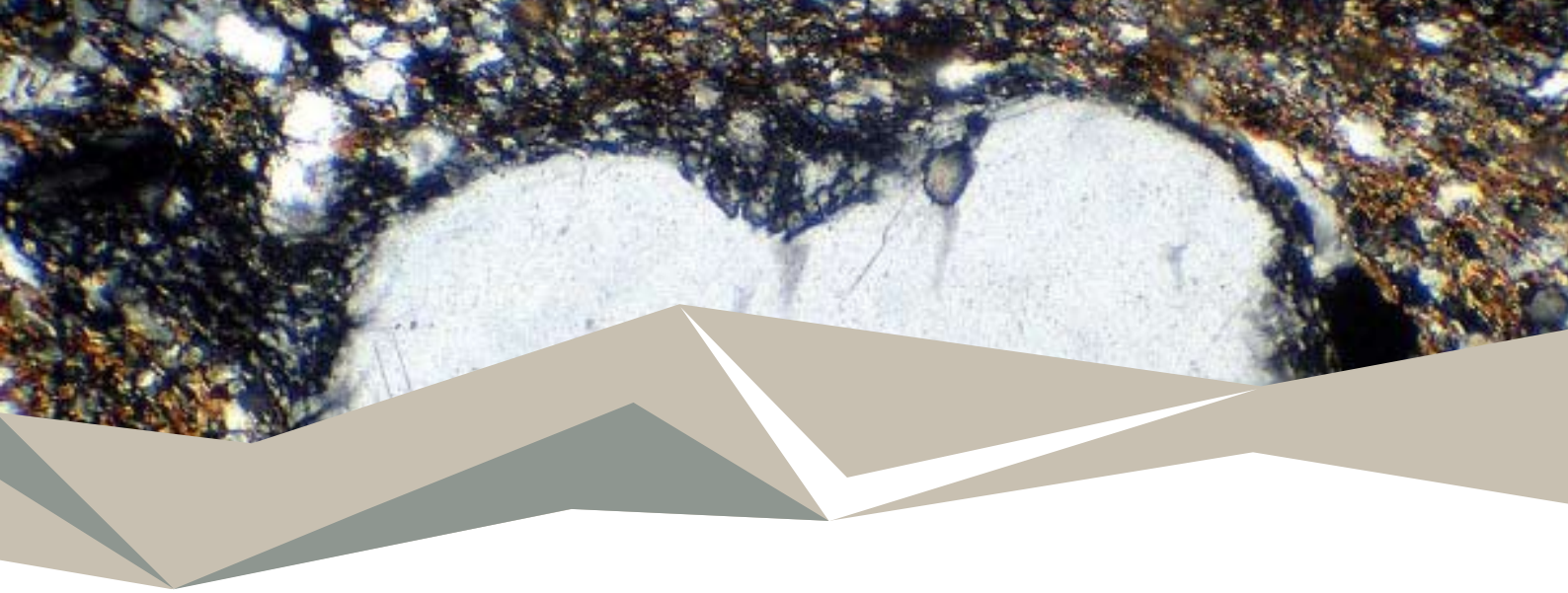
Besides the work, there were plenty of other distractions and memorable moments. The trips to the distillery and the brewery were much appreciated, as were, for the more intrepid amongst us, the opportunities to climb/crawl up Goatfell and "straight-line" various other more modest peaks. The nightlife was surprisingly vibrant as well!

All in all the trip was a resounding success and a big thanks needs to be given to all the members of staff that came along; their help and their patience were invaluable. In particular, the fact that Dr. Mac Niocaill managed to resist the urge to give up on us after the question "…and what rock is this?" was met with blank, empty expressions for the umpteenth time was highly commendable.

Despite our occasional lapses in enthusiasm we actually managed to learn a lot. The opportunity to map an area relatively unsupervised and observe in the field fossils and sedimentary structures that most of had only seen grainy pictures of in lectures was particularly instructive.

Fieldwork and field training are central to the undergraduate course. It is only through extensive field teaching that students develop the knowledge and understanding that are needed to solve the enormous range of problems that the natural world presents.

This aspect of the course is, however, increasingly difficult to sustain, and we thank those Alumni that generously contribute towards these costs.



Crystal Clear Future

by Julian Anderson (Wadham, 1957)

I came up to Wadham College, Oxford in 1957 and after 2 terms reading Chemistry with Physics and Applied Maths, the sickening realisation hit me that these subjects were just 'not me'. After a frantic search for an alternative (and inspired by my Aunt's Austrian husband who had been brought up in the Alps and had a deep interest in the mountains around him), I came across a photo of a geologist sitting on top of the Grand Canyon. The image of this man with the world at his feet filled me with dreams of travelling the world making Great Discoveries. I made the decision that this was something I could get interested in!

After an interview with the then Professor, L R Wager – a hero of 1930's Everest Expeditions - I moved after prelims from 250 chemists to what seemed a tiny family of some 25 geologists. I gather this was in fact huge; previous first years has not exceeded the mid teens. I was riveted by this new subject which, in combining my early love of the physical sciences, applied these, and so much more, to the study of an endlessly fascinating and challenging subject – the planet we live on and from whose geology all human life flows.

The sad exception was Palaeontology. This was by no means the fault of the excellent Don, Stuart McKerrow! His lovely accent could make the humble Lamellibranch sound like some mystical God, but I hated Latin and the, to me, total lack of an orderly nomenclature system deeply offended my arrogant young mind. I still shudder at my probable mark in Finals!

My two great passions became the fractional crystallisation of igneous rocks and making and studying thin section slides. On the latter, I am indebted to the lab technician who devoted so much time to teaching me the skills needed - I still have some 200 slides tucked away somewhere!
On the former, Oxford was then leading the way on the rhythmic layering of cooling magmas, especially in major intrusions. Dr Malcolm Brown, a great expert, devoted far more hours to me than my entitlement, taking me through so many mysteries. This culminated in me spending three very uncomfortable nights in a rented Austin 7 on top of a 500 ft cliff in Northern Skye, passing the days hazardously clambering up and down collecting samples.

An advantage of such a small faculty was that Finals finished at Wednesday lunch time – with a Champagne Party on the lawn outside. Vivas were on Thursday morning (mine with the External Examiner, and solely on his daughter's 'cello playing)! Results were then posted at 4.30 that afternoon; and one of our internal examiners, Dr Harold Reading, gave a great party at his house that evening (he was to be found tactfully comforting those who had been disappointed).

Julian Anderson outside the old Department of Geology

Two other memories stick out: firstly the terrible gender ratio within the undergraduates - there was only 1 woman to 7 men on average and 2 out of 24 in our year. What heroines Gill and Jane were to put up with us spotty youths! Secondly; Dr Steve Moorbath, hidden away in a far corner with a lab straight out of a Hollywood film set. A mysterious figure he was then but, little did we know it, at the very cutting edge of gas spectrometry and dating of rocks.

Though I did not pursue geology, it has pursued me round the world and given me countless hours of reward. I experienced a huge emotional surge when I was shown around the staggering new building by Hannah last October and saw how our great tradition is being taken forward. The Department of Geology has now become the Department of Earth Sciences, and seems to be richer for it. The icing on the cake was to bump into Steve, now Professor S Moorbath FRS, and exchange happy memories.

Alumni are always to welcome to visit the Department. Please contact the Alumni Relations Officer, Hannah Jackson, for more information.

Oxford Careers Service

Oxford University International Internship Programme (OUIIP)

Would you like to help?
One of the challenges of educating students in the 21st century is connecting them with the global workplace. The International Internship Programme was created to provide our students with an international experience and to act as a bridge between their studies and the start of their career.

90% of the OUIIP internships are offered by Oxford alumni and we are currently looking for more opportunities for our students for the summer of 2012. Although every intern will have a unique experience, the internships offered should comprise the following common elements:

- Full time work for 8-10 weeks, between the end of June and the beginning of October 2012
- A defined project, which creates real value for the sponsoring organisation (the work to be undertaken is not meant to be general office work) and a valuable learning experience for the student
- Interaction with an assigned supervisor or mentor within the sponsoring organisation
- A stipend to cover the student's expenses for the duration of the internship when in a for-profit organisation.

If you would like to participate in the programme by offering our students an internship place, please contact Fiona Whitehouse at **fiona.whitehouse@careers.ox.ac.uk**

Oxford Careers Network (OCN)

The OCN is brought to you by the Oxford University Careers Service to give you a way to legitimately connect with Oxford students – helping to inform their career choices and action they need to take to prepare for life beyond their degree.

Every volunteer on the Oxford Careers Network was once a student at Oxford. By providing some basic information about their current role and career path they provide current students with valuable insights into their company or occupation.

Most volunteers also go a step further and allow email contact from students, creating fantastic networking opportunities. Students and graduates really value reading the case studies and contacting volunteers for more advice and information.

Volunteers represent a broad range of occupations, from jurisprudence to journalism and from medicine to music. We are always keen to welcome more alumni to join this highly valued resource.

To find out how to become a volunteer, please visit: www.careers.ox.ac.uk/alumni/ocn

Alumni News

Norman Butcher (The Queen's College, 1954) was Staff Tutor for Scotland for The Open University, 1971-1992. He was Chairman of the East Scotland Group, Institution of Geologists, 1979-1982. Norman was President of the Edinburgh Geological Society, 1983-1985, Chairman of the European Geological Society, 1985-1987 and Chairman of the Lothian and Borders RIGS Group, 1992-1998. He has been a Senior Fellow of the Geological Society since 2001.

Dr Brian Rosen (Wadham, 1961) formerly worked at the Natural History Museum, London, in the Department of Palaeontology. He became Scientific Associate in the Department of Zoology after statutory retirement in 2002. He is continuing research and related work on a mixed voluntary and contract basis.

Dr Colin Summerhayes (Keble, 1963) is President of the Society for Underwater Technology (2009-2011), Vice-President of the Geological Society of London (2010-2014) and an Emeritus Associate at the Scott Polar Research Institute, Cambridge University, from April 2010.

Jennifer Bevan (St Hugh's, 1971) retired in October 2010 from the position of Senior Curator, the E. De. C. Clarke Earth Science Museum at the University of Western Australia. She is now an Honorary Research Fellow in the School of Earth & Environment, University of Western Australia.

Duncan McKay (Oriel, 1971) writes "after thirty years in the Oil Industry with various companies, I elected to take early retirement from Conoco Phillips in September 2010. I don't intend to lose contact with either the oil industry or the library profession. Indeed, I am two months into two terms as Newsletter Director for the Petroleum Explorations Society of Great Britain."

Professor Kent Brooks (Linacre, 1972) writes "in 1998, I was fortunate to have a mineral called after me – kentbrooksite. Now there are two additional ones: ferrokentbrooksite and carbokentbrooksite. There are probably not many people who give their names to 3 distinct mineral species. Kentbrooksite is a rare earth, niobium, manganese end-member of the eudialute group and occurs in large crystals (often new minerals these days are microscopic) and is an attractive amber-like-yellow. It has now been reported from a number of locations worldwide. Apparently it is a zirconium mineral as my DPhil thesis was on the geochemistry of zirconium and hafnium, although the naming was in honour of my work over many years on the geology of passive margin processes in East Greenland."

Andy Grainge (Keble, 1972) writes "Since leaving Yemen at the end of 2008, I spent last year in Kazakhstan before returning to work in Papua New Guinea for Talisman Energy. Although no-longer working in a technical role, I continue to find the petroleum industry fascinating because it does provide access to a range of technically innovative developments, not least in the area of sub-surface modelling and remote sense imaging. However, working in remote parts of Papua New Guinea, voice and internet based communications continue to present us with some of our major challenges."

Jeremy Penn (Corpus Christi, 1978) has been retired for some years from the Ministry of Defence (Principal Officer). He lives for nine months of the year in Cirencester, and from January-March in Cape Town.

Dr Chris Southworth (Linacre, 1980) has after 25 years with Shell, including postings in London, Istanbul, Diyarbakir and Aberdeen, latterly as Acquisitions and Divestments project manager, recently left to set up DealFrame Advisors to provide similar services on a consultancy basis.

Sarah Rutherford (nee Godderidge) (St Hilda's, 1992) married Michael Rutherford in 2009. Their first child, Hector, was born on 14 January 2011. Sarah qualified as a solicitor in 2007, and is now working as in-house counsel for a software company.

Dr Rudi Lubbe (Wolfson, 2001) is proud to announce the birth of his second child, a daughter named Vivienne Anina Lubbe on the 26 October 2010.

Dr Richard Phillips (Worcester, 2001) has recently been appointed as Lecturer in Tectonics at the University of Leeds.

Publications

Professor Brian Upton (St John's, 1951) *"Volcanoes and the Making of Scotland"* (Dunedin Academic Press, 2004); *"Edinburgh Rock"* (Dunedin Academic Press, 2006); *"Death of an Ocean: a Geological Borders Ballad"* (Dunedin Academic Press, 2009)

Dr Edward Eadie (Balliol, 1968) recently published books *"Animal Suffering and the Law"* (Seavie Press, West Lakes, South Australia) in 2009, and *"Education for Animal Welfare"* (Springer, Heidelberg, Germany) in 2011. He lives in Adelaide, South Australia.

Jennifer Bevan (St Hugh's, 1971) is the co-author of *"The Forgotten Explorers: Pioneer Geologists of Western Australia 1826-1926"* (Hesperian Press, 2010)

Awards and Prizes

Dr Charles Emeleus (Wadham, 1953) was awarded the Minerological Society's (first) Collins Medal, 2009

Dr Myles Bowen OBE (Lincoln, 1948) was awarded the AAPG (American Association of Petroleum Geologists) Pioneer Award on 17 April 2011, at its Annual Convention in Houston.

Alumni Happy Hour

All Alumni are invited to join the Department for Happy Hour on Friday 25 November 2011. This informal event will be a perfect opportunity 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-7:30pm

Date: Friday 25 November 2011

Dress Code: Informal

RSVP by November 11th to **Hannah Jackson**

Alumni Professional Networking

Join us on Thursday 23 February 2012 at the Oxford and Cambridge Club, London, for an evening of academic discussion and professional networking. Presentations from the Department will explore the impact of current research on industry and society, and will be followed by a canapé reception and opportunities for further debate.

Where: Oxford and Cambridge Club, 71 Pall Mall, London

Timings: 6:30pm-9:30pm

Date: Thursday 23 February 2012

Dress Code: Smart

Annual Alumni Dinner

The 2012 Dinner will be held on Friday 4 May 2012 at St Peter's College. This will include a 50 year reunion for the 1962 matriculation year, and a 25 year reunion for the 1987 matriculation year.

More information will follow in the New Year!

NetCommunity

A new website will be launched for Earth Sciences Alumni in Autumn 2011. With a fresh look and updated content, this secure NetCommunity will also have messaging features (opt-in only), providing an opportunity to get back in touch with lost friends.

Please visit www.earth.ox.ac.uk/alumni for more information.

Social Networking

We have an active presence on both Facebook and LinkedIn search for: Oxford Earth Sciences Alumni

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. For more information, please contact Hannah Jackson, or visit www.alumni.ox.ac.uk

Oxford Alumni Events

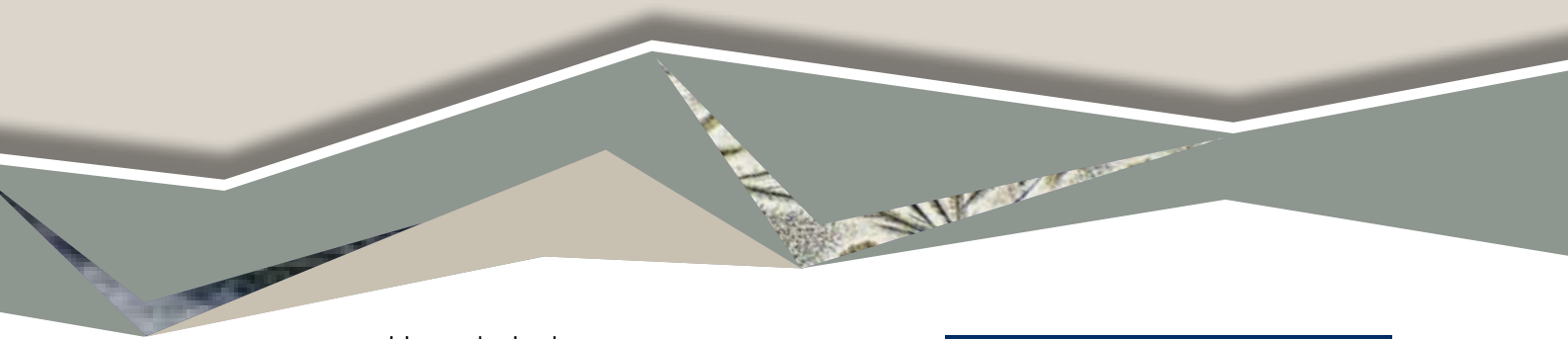
The Alumni Office runs a number of events each year in Oxford and the UK more widely. They offer everything from special tickets to Varsity events like the Boat Race and the Oxford v Cambridge Rugby Match, to wine-tastings and trips to national heritage sites or the theatre.

For more information, please visit **www.alumni.ox.ac.uk/events**

Front Cover image – Freya George (2nd year undergraduate student) takes in the view on the Arran Fieldtrip.

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 Alumni of the Department.

Please write to the editor, Hannah Jackson at the address below, or send emails to **alumni@earth.ox.ac.uk**



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

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A **£50** pays for a student rail-fare to the Assynt field trip.

B **£120** pays for a graduate student to act as demonstrator on the Pembroke pre-1st-Year field trip

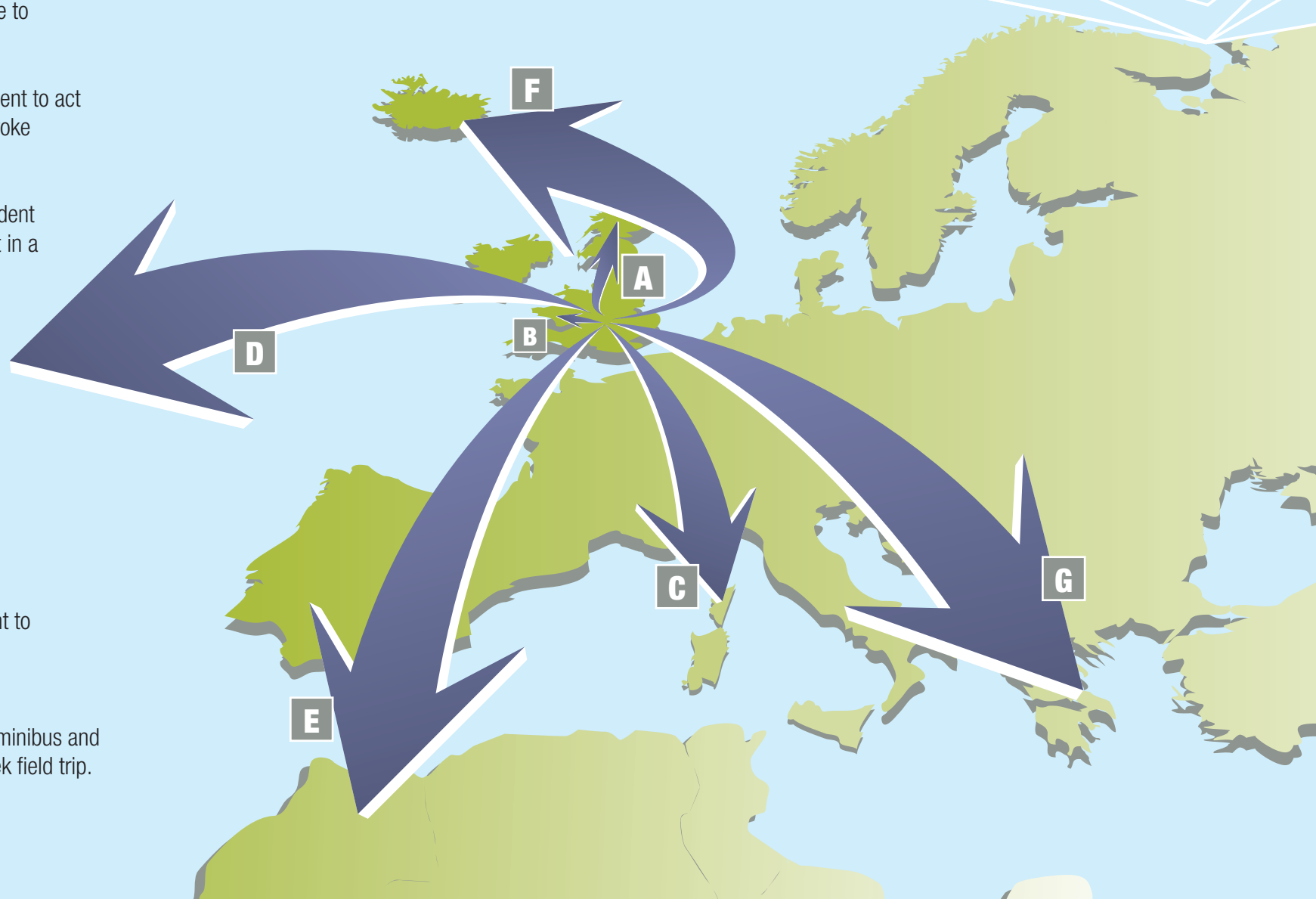
C **£250** supports a 2nd-Year student carrying out a mapping project in a challenging area in Europe

D **£250** pays for the hire of a boat and equipment to allow fieldwork in a lagoon setting during the Bermuda field trip.

E **£500** travel support allows a student to carry out field research as part of their 4th-year project.

F **£750** allows a 4th-year student to collect samples as part of a project on volcanic hazards.

G **£1,000** pays for the cost of a minibus and professional driver on the Greek field trip.



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