

THE BRIDGE

The past, present and future of Queens' College



Issue 5 | Autumn 2016



Queens' on Brexit

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& Suella Fernandes MP

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52days 3hrs 26mins...

...the time it took Dr Matteo Perucchini (2011) to row solo across the Atlantic Ocean – and finish first – last winter in the Talisker Atlantic Challenge, otherwise known as 'the world's toughest row'.

Matteo will be one of the speakers at Academic Saturday: 8 October 2016.



Imagine stepping into a boat and crossing the Atlantic alone. This is exactly what Matteo Perucchini did – battling hurricanes, Caribbean heat and ferocious competition from 26 other teams.

Adventure planning

I had been dreaming about the race for over 10 years now. I started rowing when I was 12, in Italy for clubs and again at Queens'. I'd actually found out about the race and ocean rowing by accident. I'd heard about two 19th century Norwegian fishermen who rowed across the ocean; I couldn't believe it was humanly possible at that time. Those men were brave, travelling from New York to Europe, trusting a sextant, an open boat and carrying all their water. For me, it was a revelation and that's when it became about the when and how, rather than the why.

Readyng for the journey

My primary goal was to cross successfully. In the first instance I felt that rowing solo across an ocean was a respectable achievement, even if I'd come in last. Nevertheless, I knew that – as a competitive person by nature – if I found myself in a position to compete, I would put up a fight for the win.

I was aware from the outset that I would not just have to prepare myself physically, but

Age: 34
Matric: 2011
Read: MPhil – Bioscience Enterprise
Grew up: Lake Maggiore, Italy
How far: 3,000 miles across the Atlantic
Days at sea: 52 days, 3hrs and 26mins
Starting weight: 108 kg (17 stone)
Finishing weight: 90 kg (14.2 stone)
Status: Won solo division
Boat name: Sogno Atlantico (Atlantic Dream)
From: La Gomera in the Canary Islands to English Harbour in Antigua
Start date: 20 December 2015
Solid land: 10 February 2016
Charities: Cardiac Risk in the Young & Fondazione Italiana per la lotta al Neuroblastoma

mentally, and technically as well. Physically, I worked with an experienced trainer who had supported polar explorers and international athletes. I brought him in after trying to manage an unsustainable regime which would often consist of coming home from a long day of work to pull an all-night rowing session; the trainer took a more realistic look at what I could fit into my life and created a challenging programme which incorporated a range of activities including cycling, CrossFit, rowing and boxing. I clearly couldn't avoid long sessions on the rowing machine, which in some cases lasted for

more than 24 hours. Although physical preparation was important for the challenge, it was not essential. The key to a successful crossing was mental preparation. Both yoga and meditation played a vital role. I learned short, adaptive, meditative techniques that I could use on the boat to help me through the 18/20 hours of rowing I had to sustain during crucial parts of the race. The training allowed me to find the right mental balance and overcome the myriad of obstacles presented during an ocean crossing.

I attended navigation and sea survival courses for technical preparation. The journey was made all the more harrowing with the knowledge that no outside assistance was permitted throughout the race. Each team had to carry all necessary provisions: food, cooking gas, medical kit, power and safety equipment for the entire crossing.

Sail away from safe harbour

The first couple of weeks were tough; I would take every setback personally. I would plan for a break – dry with all equipment in order – then minutes before the break, a big wave would hit and all plans were scuppered.

The mental strain of an ocean crossing is significant; you have to cope with isolation, pain, and extreme sleep deprivation while at the same time focusing on things like routing

and navigation. I was constantly strategizing: looking at the waves to try and get an optimal angle to achieve higher speeds. At first, all my thoughts looked to the past: regrets and things I should have done differently – but that was treacherous for my motivation. Once I'd taken some bruises and survived a few big storms, my perspective changed. I began learning from my experiences and started seeing everything in a positive light.

Another crucial component to keep up moral was music; I'd brought an extra battery – where other boats had been concerned about weight and brought only two batteries, I'd brought three – which meant I always had necessary power to desalinate my water, heat my food and, crucially, power my stereo! I remember the first full moon we had: I was paddling away, listening to Pink Floyd around 3am. It was very powerful; I treasure all the different songs that remind me of key moments on the water.

Terrifying storms

Storms were the worst part of the crossing, especially when they hit at night. There were a few nights where I truly feared for my life and I wasn't sure if I'd see the sun rise again. On 10 January, we were hit by the tail of a storm in the west of the Atlantic; I later learned the storm turned into Hurricane Alex. It had been 50 years since the last hurricane had formed in the Atlantic in January. I was stuck in the cabin for three days though I was lucky: other competitors remained in the cabin for five days.

Once at sea, we were essentially on our own. There were two sailing boats between the first boat and the last boat – a distance that could stretch 800 miles – so if something went wrong, they wouldn't be there to rescue us; we would have to send a mayday call and it would be up to the nearest ship to save you. We weren't in the standard shipping routes so there weren't many cargo ships around.

The storms could, at times, be useful: if a storm was going in your favour, you could ride the waves to gather as much speed as possible. If you were thrown, the boat had a water ballast to right itself if capsized. It was exhilarating at those speeds, to see the crest of the wave as high as a building.

Now that I'm back on land and can look back at those traumatic moments, I feel they were an essential part of what made the journey so rewarding.

Staring out to sea

One day I was feeling really low, stuck in a bad current; suddenly, I was surrounded by a dozen whales that swam past the boat: it was breath-taking. It's almost impossible to put the beauty of the ocean into words: nature, dolphins, whales, and the open ocean itself was incredible. The most disturbing thing to me was all the pollution; it's criminal how much plastic and rubbish we dump in the ocean. Looking at plastic bags and bottles floating past your boat over 1000 miles away from the nearest coast is heart-breaking.

Approaching land

I had found myself in second position for a while. After suddenly falling into fourth, I decided I needed to step up my momentum. Five days of essentially rowing non-stop allowed me to gather enough pace to take first place. 10 days out from the finish line, I'd secured a 50 mile lead ahead of the former frontrunner. Though I'd been strict with myself throughout the competition, as the finish line neared, I upped my game: during the day I wouldn't allow myself inside the cabin; I would row in blocks of four hour periods, with naps at the end; I would row from early in the morning to 8pm, at which point I would take a longer break to prepare the boat for nightfall; this would continue until 2am when I would sleep for a couple of hours at which point

a friend in Australia would text me my race placement; my placement would determine if I would continue sleeping or get back to the oars. It paid off in the end; I couldn't believe I came in first! It was only when, 10 miles from land, the race organisers and press team came out to congratulate me just before I crossed the finish that it sunk in.

Time for celebration

I craved cold food the whole time I was at sea. All the food was warm mush; even the water was warm – the desalinating process, combined with hot sun, left water more comparable to the temperature of tea. I would daydream about ice cream. Once on shore again – after hugging my family and girlfriend – I celebrated my win with a big pizza and vanilla ice cream.

Back to real life

I'm one of three partners in a strategy consulting firm based in Cambridge: Cambridge Healthcare Research. When we set up the business, part of initial agreement included my ocean adventure. My partners knew that when November 2015 came around I would have to switch into competition mode. They were great about it and gave me the time and the space I needed. Now I'm back and focused. It's exciting to be part of a business we've built ourselves; we provide strategic decision support to a wide range of stakeholders in the life science and healthcare industries. We work with global pharmaceutical companies and small biotech firms, some of which are in Cambridge. We actively recruit PhDs and postdocs, so Cambridge is the perfect location for us.

Queens' experience

I couldn't believe my luck when I got into Queens' for my MPhil in Bioscience Enterprise. My course was excellent and I really enjoyed rowing for Queens'. One of the best things happened on day one at Queens': I met a wonderful woman named Rebecca – she was doing a Masters in Public Health. She was there with my family to meet me at the finish line (*Matteo & Rebecca got engaged in August!*).

What will you set your sights on next?

I was lucky enough that my two business partners allowed me to drop everything and follow my dream. Now I want to focus on growing the business. Nevertheless, I have been thinking of few possible sport challenges. Watch this space...





Looking forward in the wake of Brexit

Fellow's Focus: Dr Chris Bickerton



Background:

Chris is an expert on European politics, including the development and future of the European Union. He is the author of *European Integration: From Nation States to Member States* (Oxford University Press, 2012) and *The European Union: A Citizen's Guide* (Penguin, 2016).

He has a DPhil in international relations from Oxford and is a lecturer in the Department of Politics & International Studies

Chris taught previously at Oxford, the University of Amsterdam and at Sciences Po in Paris.

Disenchanted with Europe

I was not surprised that the referendum galvanized voters and that it was so polarising. I did not predict the result though: I thought that in a risk-averse age, people would shy away from voting for Brexit. The issue was interpreted in many different ways. For some people, it was about their immediate circumstances; for others, it was about taking back control, which was the popular slogan of the 'Leave' campaign. Clearly trying to win over some of the 'Leave' voters to the Tory party, the new Prime Minister Theresa May has made this theme of taking back control central to her premiership.

For a long time, the EU was perceived as simply something out there that we are a part of. Ask British politicians or civil servants and they'll tell you that Europe is the sea in which we swim; it's just there, it's the way the world is. This is why the result of the referendum came as such a shock. Change can happen, and it can happen quickly. I think change is a very positive thing. Politics, after all, is about trying to grip hold of changing circumstances; it's about managing and directing change, not about the *status quo*. The sense "there is no alternative", in the famous phrase attributed to Margaret Thatcher, or the sense that any change is too difficult or complicated to achieve has, to some extent, gone after the 23rd June. There used to be a lot of complacency on the part of many in the EU, who believed people simply do as they are told. There is less of that around now, I hope.

'Remain' v. 'Leave' ...

Both campaigns were disappointing, with neither side choosing to focus on the EU. The 'Remain' side focused on the economy. After doing some private polling early on, they decided that there were no votes in the EU as such and chose to focus only on the economic risks of Brexit. On the 'Leave' side, they mainly focused on immigration. There is no evidence that if the UK leaves the EU, the UK government will be able to significantly reduce immigrant figures. The UK economy grows through expanding its labour market, that is the growth model we have for the moment. But immigration has become a source of concern for many people, not usually because of hostility to foreigners *per se* but because of concerns about low wages and pressure on public services. The 'Leave' campaign focused on this very successfully.

In the public events that I took part in, I sensed a disappointment from the public that neither side had effectively communicated what leaving the EU would mean for them. Doing readings and festivals related to my book on the EU, I noticed time and again that people were tired of the political mud-slinging and points-scoring which they saw during the campaign. They didn't trust what politicians told them and wanted instead to learn about the real issues surrounding the EU – the issues they would be voting on: how the EU worked, how it was funded and what would change if we left. The antipathy felt towards the political class as a whole was very strong.

Political turmoil post-Brexit...

The dramatic implosion of the political class was remarkable but not all that surprising. Some of the resignations took me by surprise: I did not expect Nigel Farage to resign so quickly. For various reasons, the British political establishment was bound to flounder with this result, as it has relied on the EU for a long time for much of its authority. This is what I mean when I talk about Europe being made up of 'member states' rather than traditional nation-states. Member states rely on the EU for their own survival. And as we've seen with the UK, an exit from the EU causes a political, economic and even constitutional crisis for member states.

Glad to be rid of anything?

The focus should be less about getting rid of regulations we don't like, as it is very possible the UK will adopt laws and regulations that are the same or similar to the ones we had before leaving the EU. What matters is the way in which rules and laws are made. Take immigration policy: it is possible for the policy itself not to change at all given the UK's present growth model. The crucial difference is the UK's immigration policy will not be an obligation foisted onto the country by the laws of the Single Market; it will be the result of a choice by the government, whose authority comes from the people. This makes the difference between a democratic system of law-making and one where laws are perceived as external obligations stemming from a distant bureaucracy. Until it has formally left the EU, the UK will of course still be within the jurisdiction of the European Court of Justice but I think it could ignore ECJ rules until it is no longer an EU member.

Being outside the EU could also make some differences in terms of policies. For instance, were a UK government to decide that it would like to offer free tuition fees to all UK students (a proposal of this kind was made by Bernie Sanders in the US when he was running for the Democratic nomination), it would have also extended this right to all students of other EU member states, which would make the policy practically impossible. Of course, this freedom works both ways: a government could eliminate progressive regulation and twist the tax system in favour of big business and the rich, some of which would have fallen foul of EU law. But I don't think being in the EU really provides protection from policies that we don't like. The only protection is to win majorities in national elections for the policies we want. That is the only guarantee that exists in a democracy.

Swift or slow and steady exit?

Though Theresa May is Prime Minister at the moment, we do not know if she will call a general election. Once we have a stable government in place, capable of managing negotiations, I believe we should trigger Article 50 of the Lisbon Treaty – the article that manages an exit from the EU – as soon as possible. The people who think it shouldn't be triggered quickly tend to be the people who hope it will never happen.

Will the European Union make an example of the UK?

Other EU leaders are keen to discourage their own populations from demanding similar referendums on membership. There is already plenty of disquiet in countries such as the Netherlands and Italy. However, salient themes have emerged from the UK referendum which mimic prevailing concerns around Europe. So punishing the UK would, in a way, also mean attacking their own citizens who share similar points of view.

What won't change?

For UK citizens, it is still too early to tell. We don't know what the negotiation package will look like. I was happy to see that the Home Office made clear recently that there is no change of status for EU nationals currently living and working here. But much still depends on the way the negotiations develop.

What is the pulse around Europe?

Brexit is a shock, no doubt. Had people in the EU institutions thought it more likely, I suspect they would have done a different deal with Cameron in February. Longer term, I don't think the EU will break apart, though I do believe that the Brexit will result in fundamental changes around Europe. There is some interest in holding referendums in other countries, in the Netherlands and Italy as well. It would be more complex for those countries to leave the EU as they are members of the EuroZone – part of the single currency – and the moment people feel one of these countries may vote to leave, uncertainty would set in and there would be a bank run of some kind. After all, with savings in Euros, people would not risk the transition to new currency if they could avoid it. Watching the complications that ensue from the British exit may result in countries thinking twice about holding a referendum, but it could also go the other way too, with Brexit a signal that countries can fundamentally reshape their relations to the EU if they so wish.

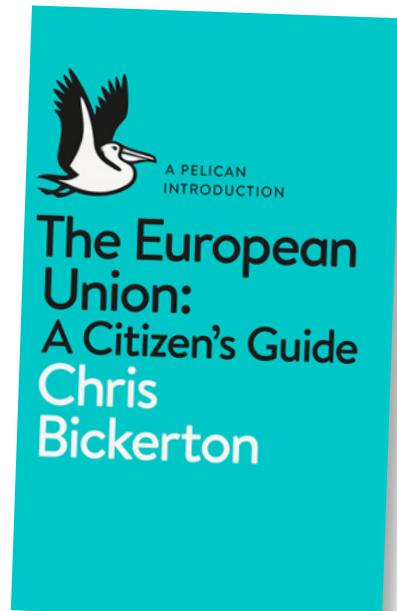
Can the EU change?

The EU doesn't have a very good record in reforming itself. It has said a number of times that it knows it must and it hasn't. I think there will be an attempt to make incremental changes and survive a while longer in its current state.

Your book

People feel that the EU is something that governs their lives but they don't often feel as if it's for them. This is pretty accurate as citizens didn't build the EU, governments did. People have a tendency to turn away from the European Union because it seems complex and distant from their day to day lives. Few academics have tried to translate the EU's jargon into ordinary language, which creates a gap between the scholarly elite who study the EU and are generally supportive of it, and everyone else who have far more mixed feelings, but also feel uninformed. This was the idea behind my book: to dispel the jargon and to write a book from a citizen's perspective. This meant uncovering a lot of information and ways of working about the EU that are not very publicly accessible. The EU is a very secretive organization in its manner of making policy and making decisions.

Publicizing a book was interesting and fun. I'd always been an academic rather than a 'writer' and the change was illuminating (though I won't be giving up my day job any time soon!); I was at the Hay Literary Festival in May and did many book signings there. People approach you with clear questions, are happy to have a discussion and to get their answer. People came at me with a huge range of questions – I learnt a lot and had to think on my feet.



Upgrading the Estate

2016 has seen a flurry of improvements to the College grounds, ranging from enhanced facilities to essential repairs:



At the end of Easter term, the replacement of the roof on the North Elevation of Old Court – over the libraries – began. The last time the roofing was replaced was in 1911. Approximately 50,000 tiles will be used, matching the existing tiles (partly handmade, all bearing the palm print of the person who formed them).

In January, after an inundation of rain, part of the riverbank broke away into the Cam. Over the coming months, we will replace the entire bank wall from the Mathematical Bridge to Silver Street, at a cost of c. £500,000. Fortunately, the Bridge has not been affected!



Unless you studied as a graduate at Queens', you may not have visited Owlstone Croft.

Located in Newnham, the accommodation houses 97 graduate students, and is in desperate need of renovation.

The renovations are being carried out in phases: the previously derelict D Block in Owlstone Croft has been transformed into the College Nursery and an additional five student ensuite bedrooms. The building was shortlisted for the '*Cambridge Design and Construction awards*' in the 'Conservation, Alteration, Extension' category.



Queens' has fitted up a bicycle repair station for students, Fellows and staff so they are not stranded before class or meetings with a flat tyre. The station is equipped with a pump and accompanying tools. For our zealous cyclists, the College also has plans to increase our bicycle parking with space for one hundred bicycles at Owlstone Croft and scores more on the main site.

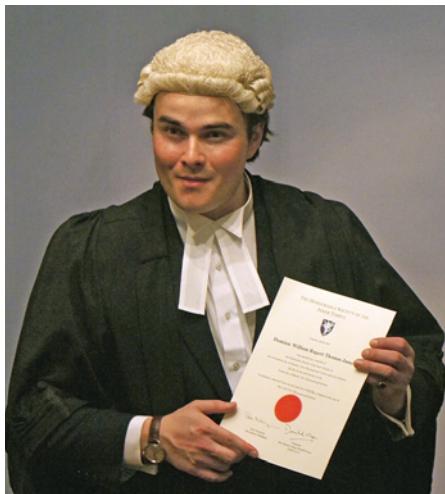
A gift from **Gifford Combs (1983)** has generously supported a College project to enhance our disabled access to the MCR's Woodville Room, making it accessible to all students and visitors. This is in addition to recent accessibility enhancements in Chapel and Old Hall. We also plan to improve access to the Essex Building in the near future.

Alumni news

Please send your news & photos to thebridge@queens.cam.ac.uk



Dr Ruchi Sinnatamby (1983) (above, left) has won a Cambridge University Pilkington Teaching Prize, with the award being given by the Vice-Chancellor at a ceremony at Queens'. Ruchi is a Consultant Radiologist and Clinical SubDean working in the Cambridge Breast Unit at Cambridge University Hospitals. She is Vice President of Murray Edwards College, formerly New Hall. She is pictured here, left, with **Mel Hudson (1983)** at their recent reunion dinner.



Dominic Thomas-James (2014) (above) was called to the Bar of England and Wales in March, by the Honourable Society of the Inner Temple. He is currently working on his PhD at Queens'.

Dr Demis Hassabis (1994 & Fellow Benefactor) has been awarded the Royal Academy's prestigious Silver Medal. He was one of three early-career engineers recognised for making a major difference in technology.



Dr Owen Arthurs (1994) (above) pounded the pavements in the London Marathon this year, wearing his Queens' gown. Though a seasoned marathon runner, this was the first marathon Dr Arthurs ran in full academic dress, for which he successfully set a Guinness World Record. He ran for Whizz Kids, an organisation that provides powered wheelchairs, manual wheelchairs, sports wheelchairs, trikes and buggies for disabled children.



Kathryn (nee Hesketh) & James Gilbert (both 2009) (above) were married at College in December 2015, six years after having met as postgraduate students.

Roy Cross (1945) has been awarded a British Empire Medal for more than sixty years of community service in Richmond, Yorks.

The Venerable John Kiddle (1976) is now Archdeacon of Wandsworth in the Diocese of Southwark.

Prof John Zarnecki (1968) flew on European Space Agency's Zero-gravity Airbus, experiencing 31 periods of zero gravity, thus becoming perhaps only the second Queens' alumnus (after **Dr Michael Foale, 1975**) to experience periods of no gravity. John has become the 90th President of the Royal Astronomical Society for the period 2016-2018.



Nailya Shamgunova (MPhil, 2011) (above) won the Hakluyt Essay Prize for 2016, writing on the subject of 'European Conceptualisations of Southeast Asian Sexual Diversity, c. 1590–1640'.

David Collard (1957) has written a play entitled 'Shakespeare's Henry VII' attempting, he says, to fill the gap in the Bard's works! It is written mainly in blank verse in five acts.



Mr Steven Sander (1996) (above) won an Emmy Award for his work as the Film Editor of the feature documentary 'Of Miracles and Men'.

Dr William Petty (1934) became a centenarian in June & **The Rt Revd John Cavell (1936)** will also turn 100 in November. The College sends many congratulations.



Tackling Air Pollution

Fellow's Focus: Professor Rod Jones



Background:

Jesus College Oxford
– BA Physics, DPhil
Atmospheric Physics

Met Office 1985-1990

Queens' Fellow 1991

Professor of
Atmospheric Science

Previous: Assistant
Director of Studies for
Physical Natural Sciences

Teaches Physical
Chemistry

Formerly Vice-
President of Queens'

Supervises 10-12
undergraduates at
Queens' across the
three years, as well as all
physical and chemistry
teaching for second years

A fan of Welsh rugby

Honoured with the 2016
Royal Society of Chemistry
John Jeyses Award
(chemistry in relation
to the environment)
– awarded for his
significant contributions

to our understanding
of the processes which
govern the structure
and composition of
the atmosphere

Having worked on all continents, and with a number of global projects currently underway from Delhi to Ipswich, Professor Rod Jones sits down to share his work relating to climate change, the healing of the Ozone and his pioneering development in air quality monitoring and low cost sensors – all in a bid to tackle air pollution.

What do you do?

I'm an Atmospheric Scientist so that covers all facets of the physics and chemistry of the Earth's atmosphere, climate and weather: I make observational studies of atmospheric structure and photochemistry, from climate change to air pollution and human health.

In the last decade, I have seen the focus change from the stratosphere to the lower atmosphere. The atmosphere controls much of the complex environment in which we live. Ozone in the stratosphere protects us from harmful shortwave solar radiation, while changes in CO₂ and other greenhouse gases are influencing the world's changing climate.

Originally, I was focused solely on the stratosphere; my DPhil was centred around using satellites to measure stratospheric composition and we made some of the seminal measurements for the time. In the late

80s, I moved to the Met Office and worked on stratospheric ozone losses on the Ozone Hole, where my work took me to the South Pole. In the mid-90s, my research began to bifurcate somewhat and evolved to include elements of the lower atmosphere; science was beginning to cast light on the effects of poor air quality.

These changes have seen my work broaden to include a wide range of projects, from street level pollution to global climate change; I'm involved across the entire spectrum.

The reason I applied as an undergraduate to Oxford was because I didn't want to do Natural Sciences, I wanted to do only Physics. Now I've gone from being a physicist to a meteorologist and ended up in the chemistry department, so I've covered Natural Sciences, but it has taken my entire career. I've come around to it and I think it's great.

Major contributors to air pollution

There is no doubt that air pollution is making a significant impact on human health and ultimately on longevity, with millions of premature deaths globally attributed to air pollution each year. Air pollution is influenced by traffic, industry, the weather, and it can even come down to which side of the street you walk on. When you put all these factors together it paints a very complicated picture.

Air quality is currently measured in the UK at just under 200 sites; this provides a useful picture but it is too sparse a network to capture the detail.

The work we've been doing with colleagues is to try to fill the gaps and develop techniques which allow us to create and measure, with precision, a high density measurement network; thus allowing us better coverage looking at smaller spatial and temporal scales, using real-time monitoring.

Making a difference

My team is comprised of around 10 researchers, working with numerous partners, ranging from teams within the University, America – working on the methane leak in California – Europe and the Far East. I've just come back from Nairobi and will soon be going to Delhi to start a new project, and will shortly be in Bangladesh; there's such variety and no two projects are alike: I've recently been on a field campaign flying at 100ft over the Pacific and on a landfill site just outside Ipswich!

In our group, we use a wide range of measurement and modelling techniques to study the chemical composition and physical structure of the Earth's atmosphere. My team and I use low cost air quality sensors which allow us to probe urban pollution in unprecedented detail. With our partners, we've developed different kinds of units, for varying applications, which allows us to get the whole picture of exposure:

- One device measures three gases; it's integrated with a GPS receiver and a mobile phone into the unit so we can communicate the measurements in real-time to a central computer for analysis.
- The very latest development is a more sophisticated unit – more so than anywhere else you would find in the world – where we measure half a dozen different gases, particles and wind. We gather this information to understand pollution sources; we know where pollution is coming from and we can build a picture of what we think air quality is like now and compare it with models to predict what it might look like in the future.
- We're linking up with experts in epidemiology and respiratory medicine at Addenbrooke's hospital and in London in order to try and understand the linkages between poor air quality and health impacts. Virtually all the studies to date are built on statistics and unfortunately everything is highly correlated so the

statistical tests can be misleading. From this, we've been developing personal air quality monitors for people who already have health problems, so the units can be carried easily; we use the same technology and mobile phones to send the data. This technology has a huge number of applications it can be used for.

Presenting the figures

There was a recent finding in January that made headlines, stating that Cambridge's air – which scored 109 on the Air Quality Index – was worse than New York City – which rated 44 on that particular day. The problem with these findings, though accurate on that date: this was a single snapshot in time when the wind in Cambridge was particularly still. It was likely that the high pollution levels over that period were linked to the slack winds; slow winds during the first cold snap of the year meant that pollution had not dispersed in the way it otherwise might have done.

These are the sort of findings we are hoping to elucidate. If wind direction is right, you can see a factor of 10 difference from one side of the street to another. We hope our work, with the help of models and other features of the atmosphere, will allow us to actually predict what's going to happen and, therefore, be able to warn people of the risks at particularly dangerous locations or times of year for air pollution.

Examining the options

Let's take the transport industry as an example. In Europe, a great number of the cars we use are now diesel powered. Diesel cars are a prime example of unintended consequences – cheat devices aside. Governments were driven by the need to mitigate climate change, so they demanded cars which reduced their CO₂ emissions. In forcing vehicle manufacturers to go down that route, rather than looking for other solutions, they didn't take into account the fact that to do that, the technology pushes towards a leaner burning engine, which is hotter, and intrinsically produces more nitrogen oxide (NOx), which creates health problems for humans and the environment. This is a perfect case demonstrating the need to look at the full picture and examine all the science surrounding any issue thoroughly before implementation.

As the issue evolves, electric cars are becoming more commonplace, and have huge benefits as they don't produce the exhaust gases that diesel and petrol produce; however, electric is not a zero-environmental cost option because you

have to make a decision about where the fundamental energy is coming from: will we use renewables sources? Nuclear? Can we use fossil fuels in a way that doesn't change the climate associated with greenhouse gas releases? Unfortunately, the problem can't be dodged because we fundamentally need the energy. The solution lies in finding a way to generate energy which minimises its impact on the environment.

An impending issue we now face, as the developing world becomes richer, is how to bring the developing world to the same quality of life as the west, while bypassing the damaging energy consumption methods by which we got here.

I've seen interesting research pioneered by the University, most notably with regards to batteries and energy storage. There are many arguments for windfarms but one of the strongest arguments against them is that quite often when you need the energy most, the winds aren't blowing and so you have to find a way of storing energy efficiently; if we can do that, this increases the flexibility of all the systems one can use. The key to managing the process is energy storage. If we produce fantastic batteries, we can move that technology into transport. Fossil fuels, for example petrol, have a huge energy density; that's why you can put a can of petrol into your car and travel considerable distances. And so, at the crux of this, we have to work out how to store comparable amounts of energy to allow for the same freedoms.

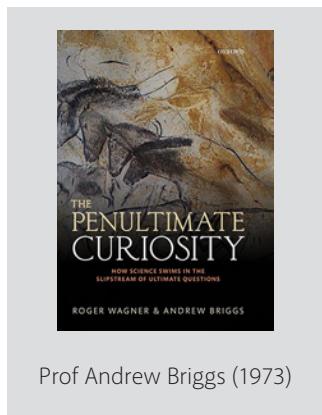
Next steps

We want to bring our technology to the classroom and engage with keen, young minds: some students will enjoy playing with the instruments; some will enjoy the coding elements; some will be interested in interpreting the data; and others will want to stand up and tell us what it all means. We want to give them a way to do that so they're not simply reading a website with answers, but rather making deductions for themselves. This work would essentially cover the entire spectrum of technical and social science; it's a very exciting idea. That's one of my dreams: to create and deliver a multifaceted tool for the next generation.

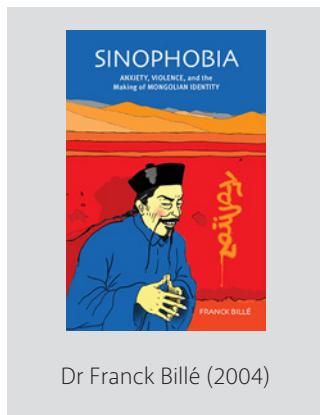
Puzzle for alumni

What is the connection between the recovery of the Ozone Hole and the single largest climate change mitigation to date... and why?

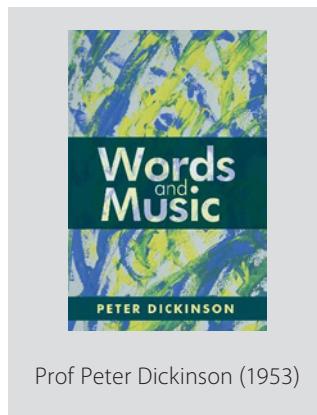
Alumni Books



Prof Andrew Briggs (1973)



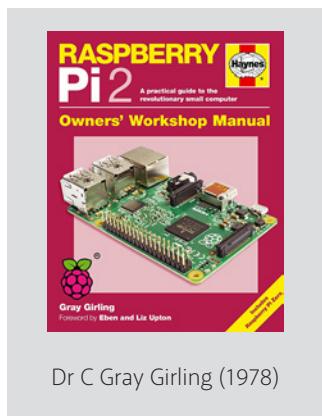
Dr Franck Billé (2004)



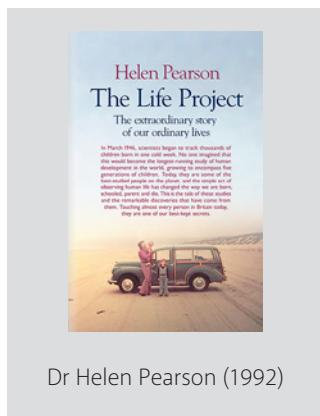
Prof Peter Dickinson (1953)



David Branson (1974)



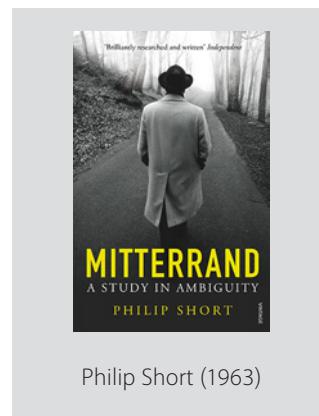
Dr C Gray Girling (1978)



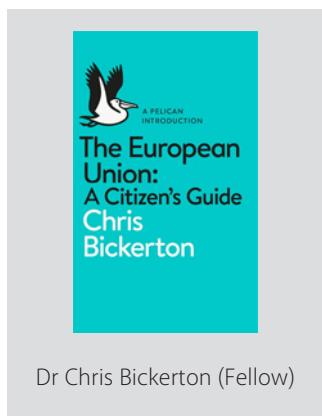
Dr Helen Pearson (1992)



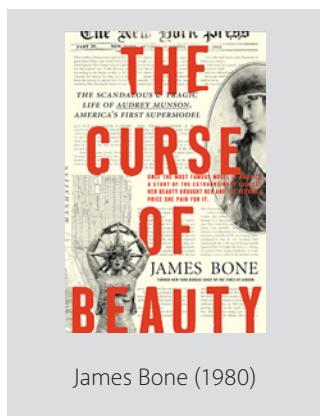
Philip Davies (1969)



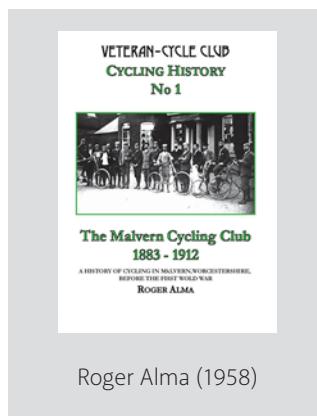
Philip Short (1963)



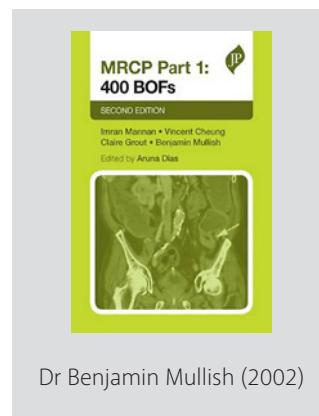
Dr Chris Bickerton (Fellow)



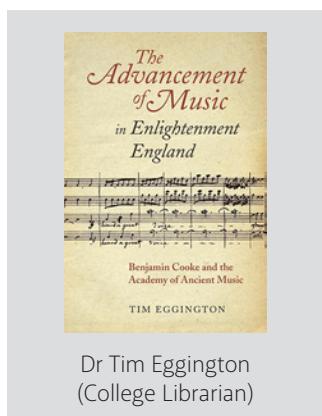
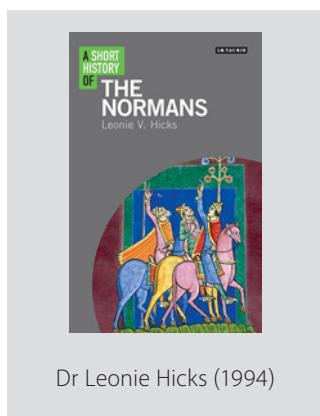
James Bone (1980)



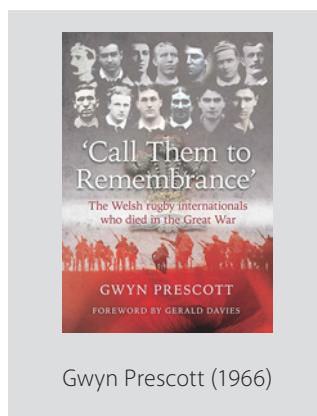
Roger Alma (1958)



Dr Benjamin Mullish (2002)

Dr Tim Egginton
(College Librarian)

Dr Leonie Hicks (1994)



Gwyn Prescott (1966)



Dr Charles Fernyhough (1986)



Lest we forget

One hundred years ago, four Queens' alumni were among the 20,000 British troops killed on the first day of the Battle of the Somme – 1 July 1916.

They were **Lt Harry Catmur (1911)**, Royal Sussex Regiment, who was aged 22; his name is inscribed on the Thiepval Memorial, alongside that of **2nd Lt Eric Clark (Did Not Matriculate)**, Royal Field Artillery, aged 19. **2nd Lt Roland Ingle (1905)** of the Lincolnshire Regiment, whose family home was on Hills Road in Cambridge, was killed aged 30. **2nd Lt Archibald Warner (1902)**, London Regiment (Royal Fusiliers), died on the same day aged 32.

At least sixteen other Queens' alumni died during the remaining four months of the campaign. The oldest of these was **Chaplain to the Forces The Revd Edward Botwood (1891)**, Royal Army Chaplains Department. He died of illness contracted on active service aged 44 and is buried in Kilmington churchyard in Devon.

By this point in the Great War, student numbers at Queens' had fallen to 29.



Queens' Brexit debate

In May, we were delighted to welcome back two Queens' alumni, fresh from the House of Commons, to lead a debate on the EU referendum for the students, staff and Fellows of the College in a packed Old Hall.

Suella Fernandes MP (Law, 1998) argued for the 'Leave' campaign, and **Stephen Kinnock MP (MML, 1988)** for 'Remain', while the President, **Lord Eatwell**, moderated.





Queens' Entrepreneurs:

The couple taking Cambridge cycling by storm.

Sally (1995, née Archer) and David Middlemiss (1995)

How did you meet?

We met in our 2nd year at Queens' – David was coaching the women's football team and famously booted the ball over the bar while trying to demonstrate how to take a penalty!

Subject of study

David read Geography

Sally read Modern & Medieval Languages (Part I) and Management Studies (Part II)

After University

We both went into corporate careers after College – David to Exxon, Sally to Reuters and on to UK Trade & Investment.

An opportunity came up for us both to get involved in Sally's family business, Rutland Cycling, in 2012 and we felt the time was right for a career change. We operate 10 stores in the East Midlands, including five in Cambridge, and a leading ecommerce website, employing over 100 full time staff.

Did you always have the entrepreneurial bug?

S: Yes, it runs in my family! My Dad was an entrepreneur and my brother and his wife have led Rutland Cycling since our father's retirement in 1990.

D: There was no history of entrepreneurialism in my family, but being Treasurer of Queens' Football Club when we ran a huge bop opened my eyes to the business world. I understand that financial model is now obsolete, but we had good shirts in 1997/98!

What are your plans for Cambridge?

We first got to know Cambridge as a cycling city as students. It feels great to be a part of the city's ambitious plans to foster cycling in Cambridge – to put Cambridge on a par with the 'Dutch model.' The support for cycling is certainly there at a public policy level, and we believe passionately that in order to embrace cycling and make it



The Way We Were: holiday in Mexico

part of people's daily lives, you've got to make it safe, easy and convenient.

We try to make renting and purchasing a bike as convenient as possible: our five Cambridge shops are open every day, and our new shop next to CyclePoint at Cambridge train station – a brand new cycle park, with free parking for 3000 bikes! – has extended opening hours through the week, to help commuters coming in and out of Cambridge.

We offer a cycle hire service, from both the train station and the city centre, which is very popular with tourists and students. We also support many Cambridge employers to get more of their workforce cycling, by providing pool bikes and offering employees tax-free bikes through the government's

Cycle to Work scheme. If you're a regular cyclist and your bike needs repairing or servicing, we try to carry out all repairs on the spot – but if the work is going to take longer, we provide a courtesy bike, so you can continue with your regular commute. To immerse yourself in the cycling culture, we also organise regular guided rides and maintenance classes, to get more people, particularly newcomers to the city, engaged in cycling and building their confidence with a friendly group.

Working as a couple

When you run your own business, you never really switch off, and so life can sometimes feel intense – but we quite enjoy this intensity and it feels good to know you're working together towards a common goal.

We just opened our most recent Cambridge shop at the railway station in April and it is already performing above expectation. The station itself is still under development, with the Ibis hotel above us and the plaza area in front of us due to open later this year – the station is virtually unrecognisable to the one we knew as students. The area will become a secondary hub for the city and we are very much looking forward to being right at the heart of it.

What sets Rutland Cycling apart?

Our model is a bit different from other bike shops – our shops are the perfect place to hire or demo a range of road, mountain, hybrid and electric bikes, which you can borrow for up to a week, so you can test ride a model on your usual route or just enjoy cycling at our venues. We've also got extensive electric bike departments, very much a growing market in the UK.



David (in red) on his cycling trip through the Andes

Oddest moment in Cambridge

A cycle was stolen from one of our shops in Cambridge; however, the thief had to learn the hard way that a crucial part of the bike was missing – the pedals! Luckily an off-duty nurse chased down the thief, along with the store team, before he could cycle the bike to the awaiting getaway car.

Are your children avid cyclists yet?

They're at the stage where they love being taken in the buggy. It's a good life for them.

Cycling highlights

Sally: I just competed in Ride London this August – it was exhilarating. I've completed the sub-100 hour Raid Pyrenean and led over 100 Breeze Bike Rides for women as a British Cycling ride leader.

David: Cycling 9,000 miles along the Andes through South America, from Cape Horn to the Caribbean. It was marginally easier than towing the kids 250 miles from Rutland to Teesside, but the fish and chips weren't as good.

20-year Reunion

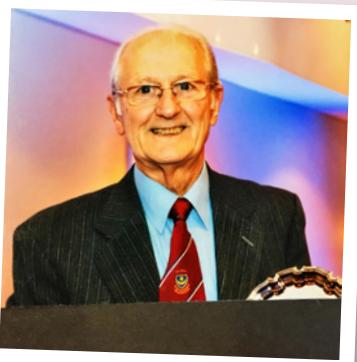
It was great being back for the reunion, we only wish it was longer – we didn't get to speak to enough people. Luckily we're often in Cambridge, so drop in store and say hi!

Queens' Entrepreneurs:

Please send us stories and photos about your business ventures
thebridge@queens.cam.ac.uk



Sally after Ride London in August



Halcyon Days

Pat Neil (1959)

Pompey, Wolves, England & The Queen Mother

I loved my football during my three years at Cambridge University – in fact, it was football that had guided me there in the first place. With organised, competitive, local schoolboy football returning in Portsmouth in the late 1940s after the dreariness of the war years, kicking a ball around with my mates, whether in the playground, the street or the 'rec', would soak up most of my leisure time. I relished playing for my junior school team on a Saturday morning and watching double First Division Champions, 'Pompey', in the afternoon at Fratton Park. By the time 'O' Levels loomed at my Grammar School, I had won local and county representative honours, and four English

Schoolboy International caps, including an appearance at (the old) Wembley Stadium in front of a record 80,500 spectators.

It was at this time that the Football Association (FA) set up annual Easter Holiday week-long coaching courses for selected under 18 public and grammar school boys, to be held at alternate Oxbridge colleges. I had attended the 1954 course at Oxford and was selected again for the Cambridge week the following year, based at St. John's College. Knowing that I would be in residence during this week, my Headmaster, always keen to promote his pupils for university consideration, saw

this as an opportune moment to arrange an interview for me at Queens' College, where I met the engaging **Mr Douglas Parmée** who would, some four years hence, and after completion of my National Service, become my Director of Studies.

Before arriving as a fresher, I had the unique experience of playing for both Portsmouth and Wolverhampton Wanderers in the (then) First Division of the Football League whilst still a sixth-former. This was an age when amateur football still enjoyed a high profile nationally, with FA Amateur Cup Finals regularly filling Wembley Stadium to capacity. On the back of my unusual dip into the professional game, I went on to win ten England Amateur International caps, the last three of which whilst I was still a student at Queens'.

The daunting thought of a return to full time academic study in the autumn of 1959 after a two-year absence was eased when I was invited to appear in the first of my three Wembley Varsity matches, which was won 6-2 by a Cambridge University team regarded by the pundits at the time as the most outstanding in living memory. I still recall with great fondness the camaraderie of my footballing student days. As a 'Blue' I was even selected to be introduced to the late Queen Elizabeth, the Queen Mother, when she came to celebrate the opening of the Erasmus Building – where, as secretary of CU AFC, I spent my final year.

Great days!

Queens' Curiosity

All alumni will know that the Wooden Bridge was designed by William Etheridge (not Isaac Newton!) and built in 1749 by James Essex the Younger.

The Bridge still stands proudly (with a few refurbishments through the centuries) and almost uniquely, as other designs in the same fashion have not withstood the test of time. William Etheridge also had a hand in building the Westminster Bridge (1749), the Old Walton Bridge (c.1748) – captured beautifully by famed Venetian painter Canaletto – as well as bridges in Coleraine (c.1750) and Dublin (c.1752). Sadly, none of these wooden structures remain.

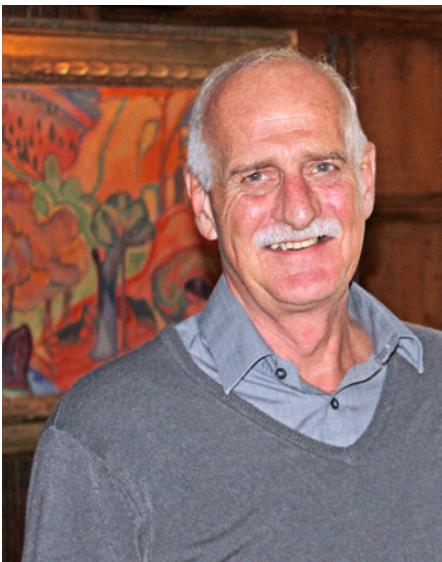
Queens' Mathematical Bridge has inspired countless engineers, academics, painters and writers. As a quintessentially Cambridge view, it is a top photographic opportunity for Chinese tourists in particular, as it was made famous by the Chinese poet Xu Zhimo and his poem *On Leaving Cambridge*. The poem is now taught as part of the Chinese national curriculum and the Wooden Bridge has come to be known as a symbol of Cambridge. A replica bridge can



be spotted in Oxford (1923) next to Iffley Lock and in Norwich, where alumnus **Peter Jarrold (1953)** has had a pedestrian bridge built – a modernised version, inspired by the one at Queens'.

Thanks to **Richard Smith (1960)** for drawing our attention to the Canaletto painting (pictured).

Have you spotted an Etheridge-inspired bridge? Let us know thebridge@queens.cam.ac.uk



Andy Cosh Dinner

Dr Andy Cosh (1968) retires in September after an association with Queens' of almost half a century. Having read Natural Sciences for two years, he switched to Economics with the help of **Professor Ajit Singh** who then became his PhD supervisor, mentor and friend. He has been an economics don at Queens' since 1975. Throughout his career, Andy has always been a pioneer: he restructured the College finances when he took over as Senior Bursar aged 34. He was involved in developing two new tripos courses – Management Studies and Manufacturing Engineering – and helped establish the Judge Business School. A keen

all-round sportsman, he represented the College in many sports and was part of a Cuppers-winning College rugby XV.

Queens' would like to endow an Economics Fellowship in Andy's honour. Typically, he has said he would like this to be styled "The Ajit Singh Fellowship".

The College is hosting a special dinner for his former students on 22 October. Those who would like to attend or who would like to support the Fellowship, please contact Fran Wagstaff at alumnievents@queens.cam.ac.uk

In Shackleton's shadow



Tim Fright (2013) retraces esteemed family footsteps to celebrate 100 years since Shackleton's famed *Nimrod* expedition.

9 Jan 1909 – 88° 23' S 162° E: "We have shot our bolt ... homeward bound at last. Whatever regrets may be, we have done our best".

Sir Ernest Shackleton's 1907-1909 *Nimrod* expedition is synonymous with bravery: Four men cross-country skiing 870 nautical miles, breaking new trails in Antarctica before being forced to turn back 97 nautical miles from the pole, three years before Amundsen beat Scott.

Exactly one hundred years later, I joined five fellow descendants of the Nimrod Expedition and completed unfinished family business in January 2008, skiing the last 97 nautical miles to the Pole. We did this in order to inspire future generations, raising awareness and support for the Shackleton Foundation, a charity that we created in his name.

Standing in the spot that my great-great-uncle Frank Wild (Shackleton's second in command), had reached all those years ago is by far the most humbling experience of my life. Cross-country skiing in minus 50 degrees centigrade in modern gear, with decent food (8,000 calories burned a day), and communications equipment – all lacking one hundred years ago, it's astonishing to think of the resilience and fortitude of Shackleton and his men.

Tim read for an MBA in 2013 and now works as Head of Executive Communications & Speechwriter for Nokia's CEO, Rajeev Suri.

His brother, Matthew Fright (2010), is researching for a PhD in Development Studies.

Floreat Domus



Remembering Dikran Knadjian (1970)

The Dikran Knadjian Scholarship has been set up in memory of a Queens' student who disappeared in Yosemite National Park in 1972.

His siblings have worked with the College to set up an annual opportunity for a medical student to pursue a fully-funded medical elective in Armenia.

Dikran's sister, Grace Davidian, commented "Dikran was passionate about studying medicine and valued giving back to his community. Our family is thrilled about helping a Queens' student to further their medical training."



**Marilia Dos
Reis Martins
(see below)**



Remember your supervisions?

The supervision system is funded entirely by the College. To secure world-class academics to lead supervisions for our students, Queens' pays a stipend for Fellows' teaching, research, materials and rooms at College. The starting stipend for a Junior Research Fellow is £5,500 which increases to c. £10,000 for the most senior positions.

With associated on-costs, Queens' pays c. £18,000 to employ a supervising Fellow. A Fellowship can be endowed in perpetuity to a cost of £600,000. Queens' has 56 teaching

Fellows who supervise our undergraduates on a weekly basis.

In the last three years, Queens' alumni have helped fund over 10 fully-endowed Fellowships and supported two fixed-term Fellowships.

Alumni can contribute to the supervision system at a range of levels. Our Development Director, Rowan Kitt, would be happy to discuss funding and naming opportunities development.director@queens.cam.ac.uk

Support for students

Among many others, these recent gifts have been donated by alumni and friends

The Sternberg LLM Studentship

Donor: **Michael Sternberg (1970)** via the Sir Sigmund Sternberg Charitable Foundation

The 1975 Bursary – to support graduate Arts & Humanities students

Donor: anonymous 1975 member

The James & Jean Bennett Engineering Prize

The inaugural recipient is **Demetrios Lefas (2012)** who has just graduated

Professor Ajit Singh Travel Award

Donor: **David Bendor (1984)**

Recipients: **Marilia Dos Reis Martins (2015, MPhil Development Studies, pictured)** travelling to India & **Tom Ellis (2014, Economics)** going to Burma

Bursaries moving forward

The key support needed for students at Queens' is help with tuition fees and maintenance costs; tuition fees are now at £9,000 per annum for a UK **undergraduate** student.

Graduate students also desperately need help with academic and living costs – the city of Cambridge is one of the most expensive places to live and study in the UK.

- Queens' subsidises undergraduate education to a total of c. £1.5 million annually.
- From 2017, the Newton Trust (Trinity College) will stop providing bursaries across many colleges which means Queens' will have to find an additional c. £90,000 per annum to make up the shortfall.
- The maximum Cambridge Bursary is currently set at £3,500 and is given on a means-tested basis to students whose household income is below £25,000. Forty Queens' students are currently eligible for such awards.

- Donations of £3,500 per annum, for three or four years, can help support one student throughout their time at Queens'. The cost of living as a student in Cambridge is estimated to be £8,400 per annum.

Paige Phelps (2012, pictured), from Coventry, graduated with a 2:1 in History last summer...

"The financial support I received from the Cambridge Bursary Scheme was a tremendous help to me during my time at Queens'. Life at university is not cheap, and coming from a low income, single parent household, support from my family alone meant I might have struggled financially during my studies. I am grateful to the generous alumni who donated towards the bursary scheme. My bursary went towards living costs, which was crucial, because these costs were not completely covered by the maintenance loans I received from the government. Money should definitely not be an issue for people wanting to study at Cambridge, and I hope that current and future students at Queens' will continue to be supported, should they need it".



Tripos stars

In 2016, Queens' was placed 6th across the University for academic results, up two places from 2015.

Among many first-rate academic results this summer...

Vytaute Boreikaite (2014) came top out of 582 Natural Scientists (Biology) in Part 1B. She was placed first in Biochemistry and Molecular Biology, Cell and Developmental Biology, as well as Pharmacology.

Alex Hardwick (2013, pictured right) was awarded a starred First in Classics Part II, coming second in the University.

Sudhir Balaji (2013) topped the year in Chemical Engineering Part IIA by a considerable margin, winning the Joshua King Prize in the process.

The Aiki Vatikioti Senior Organ Scholar, **Edward Reeve (2014)**, came first in the University in Music for the second year running (Part 1B) with a starred First.

The Max Bull Prize for Anatomy was won by **Nol Swaddiwudhipong (2015)** who came second in the Medical and Veterinary Science Tripos Part 1A

Eloise Gillow (2012, pictured left) received a starred First in Modern & Medieval Languages Part II

About 30 other Queens' students were placed in the top ten of their particular Tripos.



Playing Fields



FOOTBALL: in March, the Men's 1st XI won the Premiership for the first time. The MCR team won Cuppers yet again.

We will be holding a **Football Night** for all soccer-loving or playing alumni in the near future. Please would all previous captains and secretaries of all teams (1sts, 2nds, 3rds, Women's) get in touch to let us know what kind of evening you would like and, crucially, who played in your teams alumnievnts@queens.cam.ac.uk

www.queens.cam.ac.uk/life-at-queens/sports/queens-college-association-football-club



Lost photograph emerged... Former England cricket captain, **Walter Robins (1906-1968)**, matriculated at Queens' in 1925. He was captain of Middlesex, Chairman of the England Test Selectors and played against the great Don Bradman in an Ashes series (and dropped him). Walter also played football for Nottingham Forest.

ATHLETICS: four Queens' members of the Cambridge University Athletics team helped secure victory over Oxford at Iffley Road in May: **Sachin Hoyle (2015, MPhil)**, **Caroline Hillyer (2015, NatSci)**, **Ellie Lane (2015, History)**, **Eleanor Duck (2013, NatSci)**.



ROWING: Now and then...the 1991 Henley team enjoyed a reunion during the May bumps. L-R **Toby King (1989)**, **Dom Jephcott (1988)**, **Simon Hartley (1988)**, **Alastair Hensman (1988)**, **Jim Millen (1988)**, **Robbie Barnes (1989)**, **Marc Balston (1989)**. Below, the team in 1991.



SQUASH: the Queens' MCR Ladies Team was Cuppers and League champions this year. Well done to **Lydia Prieg (2014, Captain)**, **Cassi Henderson (2013)**, **Eloise Gillow (2012)**, **Sasha Hajnal-Corob (2011)**.



Simon Harris and Ian Middleton

ROWING: Queens' was well represented at the BNY Mellon Boat Race this year.

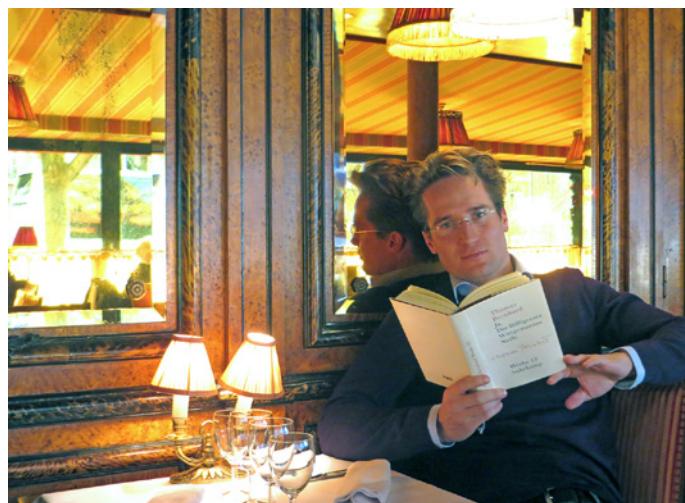
It was third time lucky for Queens' undergraduate, **Ian Middleton (Geography, 2013)**, as he coxed the Men's Eight to victory on the Thames. Cambridge won the race for the first time since 2012, with a margin of 2.5 lengths. **Simon Harris (1980, Fellow Commoner)** was the Race Umpire and **Will Warr (2014)**, a Queens' Blue in 2015, was the Finish Line judge.

Celebrating 500 years of Erasmus's New Testament

Queens' Old Library is mounting an exhibition to mark the 500th anniversary of the publication of Erasmus's ground-breaking edition of the New Testament, prepared by him whilst at Queens' in 1511-14.

Alongside his New Testament, the exhibition will feature artwork, the College's 'Erasmus chair' and other books reflective of Erasmus's Humanist interests. With most of the books having been in the library since the 16th century, the exhibition will show how Renaissance Humanism gained pace at Queens' and the role played by the College in its advancement in sixteenth-century Cambridge.

The Exhibition will be open to the public on weekday afternoons, 1.15-4.30pm, from 12-30 September. The Old Library will be open for a private viewing for alumni on Academic Saturday: 8 October, 10-4pm.



Fellowship Promotions

To Professor:

Dr Richard Rex (Polkinghorne Fellow in Theology, pictured right)

Dr Richard Nickl (Maths, pictured above)

Dr Craig Muldrew (History)

Dr Ashwin Seshia (Engineering)



To Senior Lecturer:

Dr David Parker (Physiology)

To Reader:

Dr Graham Treece (Engineering)

Find College friends

We are often asked to help put old members in touch with friends they've lost contact with. Luckily, two Queens' alumni have come up with an innovative new platform designed to help alumni find old members with the click of a button. **Sebastian Manhart (2014)** and **William Fairbairn (2014)** have created '**Polis**', a quick and easy-to-use networking platform.

This winter, the site will go live and we will invite Queens' alumni to join and reconnect with old friends and classmates. This will be an exclusive platform, open only to Queens' alumni and students.

Polis is a perfect tool to reconnect before and after reunions or if you'd like to set up your own groups. All you need is an email, photo and matriculation year.

Look out for an invite in your inbox or register your interest alumni@queens.cam.ac.uk

Queens' College Alumni Events Series

2016

September

'1956 & Before' Reunion Lunch
Wednesday 21 September 2016

October

Freshers' Parents' Tea
Saturday 1 October 2016

Academic Saturday

Saturday 8 October 2016

Oxford Regional Dinner
Friday 14 October 2016

Queens' Distinguished Lecture in Law
by invitation
Wednesday 19 October 2016

Andy Cosh Former Students' Dinner
email alumnivevents@queens.cam.ac.uk
Saturday 22 October 2016

November

Investment Finance Reception
by invitation
Wednesday 2 November 2016

1985 & 1986 Reunion Dinner
Saturday 12 November 2016

Queens' Choir concert in St Martin-in-the-Fields – Haydn's Creation
Thursday 17 November 2016

December

The Varsity Match
Thursday 8 December 2016

2017

January

Edward Reeve, Aliko Vatikioti Senior Organ Scholar, plays Bach in the Long Gallery
Saturday 7 January 2017

March

1967 50th Reunion Dinner
Saturday 18 March 2017

April

Cambridge Regional Dinner
Thursday 27 April 2017

May

2007 10th Reunion Dinner
Saturday 6 May 2017

1997 20th Reunion Dinner
Saturday 20 May 2017

June

Alumni Family Day & Garden Party
Sunday 25 June 2017

The Arthur Armitage Society & 1448 Society Garden Party
Sunday 25 June 2017

September

'1957 & Before' Reunion Lunch
Wednesday 20 September 2017

November

1977 & 1978 Reunion Dinner
Saturday 11 November 2017



From Michaelmas, the archive of Record magazines, dating back to 1925, will be available online – thanks to the generosity of **Michael Kershaw (1975)**.

Hard copies of the 2016 edition can be made available, for a small charge, by contacting the Alumni & Development Office alumni@queens.cam.ac.uk.

The Bridge: produced by Marisa Crimlis-Brown

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