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CAM
Cambridge Alumni Magazine
Issue 80 Lent 2017

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YBM
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Welcome to the Lent edition of CAM. This year, India – the world’s largest democracy – celebrates 70 years of independence. In Cambridge, the University will mark the anniversary with India Unboxed, a year-long programme of events and exhibitions drawing on its collections. And on page 14, Dr Manali Desai discusses what recent Indian history can tell us about the nature of democracy – both its own and others around the world.

We live in interesting times. Fake news and alternative facts can make it difficult to know what is true and what is not. On page 22, we explore the world of conspiracists and conspiracy theories, and find that sometimes, the truth can indeed be stranger than fiction.

Meanwhile, on page 32, Dr Michelle Oyen explains why bioengineering is where it is at and on page 28 we examine why Malthus – long thought of as the high priest of population control – is being reinterpreted for the 21st century. On page 36, Dr Emily Lethbridge explores a world of rock, ice and saga.

Finally, thank you for your many letters on the crossword, your memories of Heffers and other Cambridge institutions, and of the University Library – keep them coming.

Mira Katbamna (Caius 1995)
to the news that a majority of the British electorate had voted in favour of the United Kingdom leaving the European Union.” Less than 38 per cent of the electorate voted to leave. Passive acceptance of the myth that a majority did so has resulted in the public debate on the important choices now facing the nation becoming a great deal nastier than at any time I can remember in British politics.

**Martin Olsson**
*(Clare 1962)*

**A Heffers history**

As ever, I greatly enjoyed the Michaelmas edition of CAM (arriving late in Lisbon, as it always does, due to the vagaries of the diplomatic bag). I particularly enjoyed the piece on Heffers. It brought back fond memories of growing up in Hertfordshire. Every so often, on a Saturday, my parents would take me and my brothers to Cambridge for a sticky bun at Belinda’s (another Cambridge institution, now gone I think) and to buy a book at Heffers. Heffers bookmark. I honestly enjoyed the piece on Heffers. It brought back fond memories of growing up in Hertfordshire. Every so often, on a Saturday, my parents would take me and my brothers to Cambridge for a sticky bun at Belinda’s (another Cambridge institution, now gone I think) and to buy a book at Heffers. Heffers bookmark. I particularly enjoyed the piece on Heffers. It brought back fond memories of growing up in Hertfordshire. Every so often, on a Saturday, my parents would take me and my brothers to Cambridge for a sticky bun at Belinda’s (another Cambridge institution, now gone I think) and to buy a book at Heffers. Heffers bookmark.

**Peter Abbott**
*(Magdalene 1998)*

“...a lot of bookshops have come and gone in Cambridge”. I remember returning one night from London in a coach singing to the tune of Frère Jacques: “Bowes and Bowes, Bowes and Bowes, and Heffers as well, Heffers as well. Galloway and Porter, Galloway and Porter, Deighton Bell, Deighton Bell!”

**Joan Schneider**
*(Girton 1948)*

I am currently reading a book I bought in Cambridge for 4s.6d, and using a Heffers bookmark.

**James Seddon**
*(Trinity 1958)*

**What a hypocrite!**

None of us is perfect, but the “creative” tension that Matthew Parris mentions surely comes not from a facile acceptance of hypocritical immorality, but from the noble struggle to live ‘a good life’. The deepest personal satisfaction and widest social benefit are achieved when we strive in all our actions, both public and private, to leave the world a better place than when we found it.

**Daryl Tayar**
*(Jesus 1985)*

In his essay, *The Empty Universe*, writing about David Hume, CS Lewis agrees with Matthew Parris about the separation that exists “between how we think and act in the course of daily life, and where our minds may take us when we give ourselves over to philosophical contemplation”, but whereas Parris regards this as “a creative thing”, Lewis identifies it as a clear signal that a wrong philosophical step has been taken somewhere along the line.

**Philip Almond**
*(Downing 1964)*

**Greek play**

In the Lent Term of 1956, I was cast in the Chorus of *The Bacchae*. At a late rehearsal in the Arts Theatre, one character forgot a line. A prompt came from the darkness of the stalls, the voice of Professor Denys Page, a vice-chairman of the Greek Play Committee.

The story promptly went round the cast that Professor Page, who was much loved and admired, knew the whole of *The Bacchae* off by heart. When challenged about this, he admitted he didn’t know the whole play, “But I did know that bit!”

**Anne Mathews**
*(née Wilcock, Newnham 1955)*

**Feedback**

Hooray for the new format written on an off-white background and in a typeface that anyone over the age of 40 can read!

**Anna Bacon**
*(Emmanuel 1981)*

CAM 79 is totally brilliant! Fascinating – especially My Room, Your Room and the Heffers history piece, which brought back wonderful memories. Thank you.

**Neil Calver**
*(Christ’s 1983)*

Many thanks for the latest issue of CAM. Lots of thoughtful articles as well as the regular columns. I also like the fresh look of the magazine.

**John Gamlin**
*(Fitzwilliam 1958)*

Write to us

We are always delighted to receive your emails and letters.

Email your letters to: cameditor@alumni.cam.ac.uk

Write to us at: CAM, 1 Quayside, Bridge Street, Cambridge, CB5 8AB.

Please mark your letter ‘for publication’. You can read more CAM letters at alumni.cam.ac.uk/cam. Letters may be edited for length.

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MORE FROM THE CAM MAILBAG

Eagle-eyed readers noted our request in CAM 79 for your thoughts on CAM’s fiendishly difficult crossword. Was it too hard? Not hard enough? Louise Wright (New Hall 1991) was clear. “Please, please, please do not change the crossword,” she wrote. “Easier cryptics are available in the majority of newspapers but puzzles of this standard are far rarer.” Robert Eastwood (Trinity 1967), David Carter (Pembroke 1973) and Gerald Vinestock (Clare 1956), among many, many others, agreed. Jim Waterton (Emmanuel 1981) adding, “They are works of art.” It was not all praise, however. Peter Bussey (Jesus 1964) found that the instructions were “sufficiently obscure that I have difficulty in understanding them” and Martin Robiette (King’s 1962) thought that solving the puzzle was akin to “playing chess without knowing how each piece moves”.

Prompted by our history of the UL’s tower, we were amused to read Alan Hakim’s (King’s 1953) report of where the Library really kept its racier tomes in the early 1950s – apparently those in the know were to “Enquire in Anderson”. And we greatly enjoyed Ronald Edge’s (Queens’ 1947) frankly hair-raising recollections of the late Sir Denys Wilkinson’s attempts to launch shearwaters off the top of the tower. To find out what happened, visit: alumni.cam.ac.uk/magazine.
OLD SCHOOLS

New leadership

The University has made a number of key leadership appointments aimed at ensuring that Cambridge is equipped to thrive in today’s challenging global higher education environment.

Anthony Odgers, currently Deputy Chief Executive of UK Government Investments, will join the University in May as Cambridge’s first Chief Financial Officer. A Caian, Odgers will have oversight of all the University’s assets, including Cambridge University Press, Cambridge Assessment, the University Endowment Fund and technology transfer.

Professor Andrew Neely has been appointed Pro-Vice-Chancellor for Enterprise and Business Relations. He is currently Head of the Institute for Manufacturing and the Manufacturing and Management Division of the Engineering Department, and a Fellow of Sidney Sussex College.

Dr Jessica Gardner will take up the post of Librarian in April. She is the second woman in the history of the institution to hold the role. Dr Gardner said: “I am delighted to have been elected as Cambridge University’s Librarian and to have the opportunity to build on the success of a long line, over 600 years, of my predecessors, most recently the wonderful Anne Jarvis.”

In October this year, Professor Stephen Toope will take up the role of 346th Vice-Chancellor of Cambridge.

Read more about the University’s leadership at: v-c.admin.cam.ac.uk/pro-vice-chancellors.
The number of alumni who took part in the 2016 alumni survey. Seventy-two per cent of readers surveyed said they read every, or most, issues of CAM. For which, thank you.

IN NUMBERS

30,469

Thanks to alumni and friends the fifth fund has recently been raised.

“Thanks to alumni and friends the fifth fund has recently been raised. This support from alumni is playing a vital role in the Cambridge ecosystem,” said Dr Anne Dobrée, Head of Seed Funds at Cambridge Enterprise. “Two funded companies are already reaching success, and we look forward to supporting the next generation with Fund V.”

The Cambridge ecosystem

Thanks to alumni and friends the fifth fund has recently been raised. “This support from alumni is playing a vital role in the Cambridge ecosystem,” said Dr Anne Dobrée, Head of Seed Funds at Cambridge Enterprise. “Two funded companies are already reaching success, and we look forward to supporting the next generation with Fund V.”

Real world applications

Since 2012, the Seed Enterprise Investment Scheme (SEIS) and the Enterprise Investment Scheme (EIS) have invested £7m in a diverse range of technology and life sciences companies, such as Jukedeck and Quethera.

A fund, you say?

Cambridge Enterprise provides both investment and expertise to help give startups the best chance of success. Since 1995, they have invested in 77 companies that together boast a three-year survival rate of 80 per cent, compared with a national average of 30 per cent for technology companies.

Cambridge innovation

Innovation and enterprise

Cambridge Enterprise was set up to support the innovations and expertise of Cambridge’s staff and students and transform these ideas into commercial success. The University of Cambridge Enterprise Fund (UCEF) helps secure investment for startups – and supports the mission of the University.

A fund, you say?

Cambridge Enterprise provides both investment and expertise to help give startups the best chance of success. Since 1995, they have invested in 77 companies that together boast a three-year survival rate of 80 per cent, compared with a national average of 30 per cent for technology companies.

NEW BOAT HOUSE

The new University Boathouse has been officially opened on the River Great Ouse in Ely, bringing three University rowing clubs – CUBC, CUWBC and CULRC – under the same roof for the first time. The new building was designed by architect Jerry Bailey, and financed with the assistance of more than 450 alumni and friends of the three clubs. Ely Project Manager Ewan Pearson, said: “It has been a thrill to lead the project team and I am certain that success will follow, both against Oxford, and at an international level.”

DECONSTRUCTED

Two-minute Tripos

Just seen incredible new evidence about how the lamestream media has been lying to us all these years. Earth is, in fact, FLAT!

Hmm. Are you quite sure about that? Consider, for example, the many photographs of a distinctly round Earth from space.

I’ve seen them! But what if they were FAKED? I just don’t know.

OK, let’s try this: it would certainly be in the interests of fantasists to make you believe that the Earth is flat, to sell their strange magazines. But the Earth is certainly round.

I agree now! But I’m not sure why.

Well, I’ve given you a kind of psychological vaccine, in the form of the correct information along with a dose of the kind of misinformation you’re likely to encounter on this topic.

A mind vaccine? Like in the CIA?

No. New research has found that when you present people with a fact and then follow it with misinformation, the two cancel each other out. But when you add a ‘vaccination’ to the fact and misinformation – such as an insight into the distortion tactics used by certain groups – a person is more likely to hold on to the actual fact.

But how could this possibly be applicable in the real world?

We have the internet to check our facts for us.

Well, some people are concerned about the spread of ‘fake news’ and disinformation, particularly regarding issues such as climate change. Dr Sander van der Linden, social psychologist and Director of the Cambridge Social Decision-Making Lab, who led the study, says: “Misinformation can spread and replicate like a virus. The idea is to provide a cognitive repertoire that helps build up resistance to misinformation, so the next time people come across it they are less susceptible.”

They’re creating a mind-control virus??

I think it’s already here.
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- 3-night Durres extension available

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As Russia is accused of influencing the US elections, the conference theme proves, well, timely.

Dr Rosalind Polly Blakesley is Head of the Department of History of Art, Reader in Russian and European Art, and a Fellow at Pembroke.

No two days are ever the same. Never has this been more true than this past Michaelmas term, as I take over as Head of Department and Chair of the Faculty of Architecture and History of Art. The job brings the expected slew of committees, meetings and responsibilities, but I’ve learnt to be braced for the unexpected, too. Within days of starting, we hear that the History of Art A Level is to be axed. A flurry of consultation to support a national campaign ensues, thankfully compelling a different exam board to offer the A Level from September 2017. The robust debates confirm the vibrancy and relevance of art history, its imperative to generate visual intelligence in our fiercely visual world.

Other aspects of the job have been less fraught, but no less fascinating. Joining the Kettle’s Yard Committee leads to a hard-hat-clad exploration of the current building site, before we gather to plan for the reopening. The Director and I have been developing new collaborations between the Department and Kettle’s Yard, to maximise the use of its collections in our teaching and research.

I also find myself a Syndic of the Fitzwilliam, where a behind-the-scenes tour reveals an institution with world-class collections and staff, but bursting at the seams. I return later with our MPhil students to consider the museum’s modern and contemporary crafts, and the gendered prism through which these have often been viewed.

My PhD students lure me down equally intriguing paths. One, via Skype from Moscow, tells me of a 19th-century artist’s journey from his native Siberia to St Petersburg atop a wagon of frozen fish. Another takes me to the Ashmolean in Oxford, where she is using a remarkable collection of prints to reveal neglected aspects of 18th-century Russia’s urbanisation. We pore over images of bridges, and agree that we need to get a civil engineer on board.

My own research has inevitably taken a back seat, though I travel briefly to Yale to give a paper and the Cambridge Courtauld Russian Art Centre, which I co-direct, helps to organise a conference in Yaroslavl. Just weeks before Russia is accused of influencing the US elections, the conference theme – the role of printed media in the formation of national identity – proves, well, timely. Discussion is heated and revelatory, reaffirming the ways in which cultural debates can resonate in broader social and political spheres.

There is also a rich afterlife to the exhibition Russia and the Arts, which I curated at the National Portrait Gallery last year. Particularly poignant is the testimony of a young Russian living in London, which, she says, is no easy gig, as she is invariably pigeonholed as an oligarch’s moll or a Putin acolyte. There is scant recognition of normal, hardworking Russians who come to Britain to experience a different culture and develop their careers in the way that we accept other nationalities do. But my correspondent finds that the exhibition has prompted people to ask her different questions about herself.

As term nears its end, I escape to London for a Trustees’ meeting at the National Portrait Gallery, before retreating to Pembroke to prepare for admissions interviews. I meet with the visiting Fellow in Islamic Art to discuss our shared ambition of establishing the subject as a permanent fixture. Having served on the committee to appoint an architect for Pembroke’s expansion on the other side of Trumpington Street, I’m also keen to learn how this is progressing. As I say: no two days are ever the same.

Dr Blakesley is the author of The Russian Canvas: Painting in Imperial Russia, 1757-1881 (Yale University Press) and Russia and the Arts: The Age of Tolstoy and Tchaikovsky (National Portrait Gallery).
Clough 101, Newnham

Katharine Whitehorn (Newnham 1947) and third-year social scientist Lydia Woodward discuss innocence, experience and the Newnhamite spirit.

When veteran journalist Katharine Whitehorn (Newnham 1947) opens the white-painted door of Clough 101, the memories – from a remarkable seven decades ago – come flooding back.

“I remember going out at a time when I wasn’t supposed to,” she says, smiling, as she looks round the airy square room situated above Newnham’s SCR. “And going down a ladder with a bottle of milk. Why milk, I can’t now recall, but it was definitely not something I was supposed to be doing! I imagine it’s much more straightforward to live here now.”

“There are still a few rules,” says the room’s current occupant, third-year HSPS student Lydia Woodward. “Like Blu Tack on the walls, or parties that go on too late. But luckily on the other side of the wall is the Great Hall and beneath that is the SCR, so I get away with murder.”

With a twinkle in her eye, Whitehorn suggests that her more daring escapades took place away from College grounds – although her escape with the milk bottle “was very innocent. It couldn’t have been less wicked in any possible way.”

In fact, for Whitehorn, and for many Newnhamites of her generation, the College’s spacious rooms represented something profound. “It was very much my own place. You could do what you liked in it. It was absolutely marvellous to be here, and be me, with things I wanted to do and people of my choosing.”

She can still remember the telegram of acceptance. “It said ‘Place offered’ and it was marvellous, because coming from school, what the hell else are you going to do but hope to go to Cambridge!”

The Cambridge that Whitehorn came up to in 1947 still denied women full graduation rights. (That change happened a year later.) Many University facilities and teaching opportunities were sex-segregated. But Whitehorn, studying English, was not deterred. She had her sights set on being taught by the renowned Yeats scholar, Thomas Rice Henn, Fellow of St Catharine’s College. “I was so keen on Yeats. I had a friend I wrote to and said, ‘You’ve got to get Henn to teach me,’ and he wrote to him. Henn had a once-a-week gathering of people to which I was invited – the only woman. I could still recite Yeats now!”

That enterprising nature stood Whitehorn in good stead when she left Newnham and she tried her hand at everything from running an English-speaking club in Finland to waiting tables while holding a Fulbright scholarship at Cornell. And like Whitehorn, Woodward has broader experience than many undergraduates. “I studied Linguistics for...
IN BRIEF

YOUR DATA
New legislation, in the form of the General Data Protection Regulation (GDPR), is coming in next year to protect your personal data. We may soon need your consent to maintain your relationship with us and to ensure you continue to receive CAM. To find out what GDPR is, why it matters and how you can give consent to maintain your relationship with Collegiate Cambridge, look for our feature in CAM 81.

ICE DISCOUNT
The Institute of Continuing Education (ICE) can benefit you throughout your adult life. It offers online courses in everything from Iron Age archaeology to international development, meaning you can study at Cambridge wherever you are in the world. CAMCard holders are entitled to a 10 per cent discount on course fees when booking short courses at ICE. This includes day schools, weekends, weekly classes and online courses. To claim your discount, find your chosen course on the ICE website (ice.cam.ac.uk), click the link to ‘Book now’ and enter ICECAMCARD when prompted to enter your booking code.

SAVE THE DATE!
The 2017 Alumni Festival will take place over the weekend of 22-24 September. Along with the chance to attend exclusive lectures from world-leading academics, the Festival will feature opportunities to sing in King’s Chapel and get behind the scenes at Cambridge.

A CAMBRIDGE GUIDE TO...

Global Cambridge

With more than 230,000 alumni in 193 countries, the University’s global reach is one of its most extraordinary aspects. And now, the Global Cambridge series is bringing the University’s top researchers and thinkers to meet alumni at locations across the world – including Melbourne, Sydney, Leeds and Paris. Following sell-out events in Bristol and Edinburgh, the next stops will be Hong Kong (8 April) and Dusseldorf (24 June). The series showcases how Cambridge research is trail-blazing the path to new discoveries, ideas and inventions.

To find out more or to attend an event, please visit alumni.cam.ac.uk/events.

END OF REPORT

18 months, travelled, then studied Social Anthropology,” she explains. “Newnham is a really interesting vantage point from which to watch the issues that affect students today. Putting a lot of young women together creates a space that feels very different from the rest of the University.”

Whitehorn’s time at College “made me feel like I was beginning to be grown up. An awful lot of things happened more or less through Cambridge that were extraordinarily important to the nicer bits of my life.” Those nicer bits included a groundbreaking career in journalism. Whitehorn started out on Picture Post, then moved to The Observer in 1960, where she was a columnist for nearly four decades. The recognition she has received ranges from being made CBE in 2014 to a turn on Desert Island Discs.

Whitehorn’s energy and good humour – still on full display at nearly 90 – were an ideal fit for the times she studied in. “It was a good time to be here,” she says, taking in Woodward’s desk beneath the window, and the bright posters on the wall. “There was a feeling that the bad times were over. A great feeling of optimism: ‘Now we can start to make things well and get things right’.”

A similar spirit, Woodward says, pervades Newnham’s current generation, who are dealing with a year of unexpected – and to many, unwelcome – political events. “People are talking about what we can do to look forward, now. What we can do to ameliorate this situation.”

Seventy years may have passed between Whitehorn’s occupancy of Clough 101, and the buzz of activity in the corridors outside today. But when asked for three words to define her time at Newnham, the veteran journalist says, “free, happy, and useful” – and the undergraduate beside her nods.

Katharine Whitehorn is an author and journalist. Lydia Woodward is a third-year Human, Social and Political Sciences student.
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Offside rule? We invented it.

The Cambridge University Association Football Club may be the oldest football club in the world but it is still going strong in 2017.

An ardent footballer since the age of eight, captain Henry Warne (Fitzwilliam) was down at the Cambridge University Association Football Club doing pre-season try-outs a week before officially becoming a Cambridge fresher.

“It was the best introduction to university I could have possibly had,” remembers Warne, now a fourth-year studying History and Philosophy of Science. “By the time term started, my nerves had gone – I’d already met 20 like-minded people.”

The 40-strong society, consistently in the top league of male and female university football, is believed to be the oldest club in the world and, last October, was inducted into the National Football Museum Hall of Fame. In 1846, the founders drew up the first major code for playing the game, including the offside rule.

These days, life for Club members revolves around the beautiful game just as much as academic studies. The teams study hard and play hard, with games around the country on Wednesdays and training on Sundays and Mondays. “Cambridge is stressful, but that intensity makes the bond with teammates strong in a way I’ve never experienced in other teams – these friendships last forever.”

To find out more about the Cambridge University Association Football Club please visit their website, at cuafc.org.
Renew your connections with Cambridge this summer

Why not try a different way of re-connecting with Cambridge and immerse yourself in the University’s International Summer Programmes, established in 1923. Re-visit your degree subject, or try something totally different. Join adults of all ages and backgrounds from over 50 countries, including the UK. Come for one week or two, or even all six, between 9 July and 19 August. Stay in Clare, Gonville and Caius, Newnham, Selwyn, or be non-resident. Bring your friends and family: it’s an ideal opportunity to share this amazing place and to inspire future generations.

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Visit: www.raverat.com to browse our gallery buy prints and other merchandise. Enter code CAM17 at checkout for a 10% discount.
Catching the flu

Derek Smith is Professor of Infectious Disease Informatics in the Department of Zoology.

One hundred years ago, half of all deaths were caused by infectious disease. Today, that proportion is down to 25 per cent – mostly because of vaccines, antibiotics and improvements in hygiene. Despite this substantial progress, there is a class of pathogens that still cause major problems – those that can change, can evolve, to escape from drugs that used to work and from immunity induced by vaccination or natural infection. Most important among these pathogens is the influenza virus.

About 10 per cent of the world’s population gets flu each year, many millions are hospitalised, and half a million die. Because flu transmits mainly through the air, its spread can’t easily be controlled through hygienic measures. But its most important trick is that it has a seemingly endless capacity to evolve to escape the immunity we get from previous infections, or from vaccines.

One approach to a more permanent protective solution to this virus-on-the-run is the idea of a universal vaccine – a vaccine that targets those parts of the virus that don’t change over time. Though this is a conceptually elegant approach, it remains fraught with challenges, and it remains to be seen if it can be successful.

A radically different approach is to beat the virus at its own game: to predict how it will change, and to vaccinate with a strain from the future. So instead of the virus being one step ahead of us, we are one step ahead of the virus.

Not long ago, most virologists, immunologists and vaccinologists would have said such a prediction was impossible. Nobody understood the evolution well enough, and the possibilities seemed endless. Each time the virus changes, it does so with at least four mutations in 135 possible places (that’s more than a trillion possibilities). Moreover, nobody has ever been able to accurately predict the details of such an evolutionary change in any area, never mind for such an important pathogen.

My research group in Cambridge, together with our close collaborators, the groups of US virologists Ron Fouchier and Yoshi Kawaoka, have been working on figuring out the basic evolutionary processes that govern the evolution of influenza viruses. Over the past 15 years we have made three key discoveries in this area that, when combined, have brought us to a place where predicting what the virus will do next is within reach.

First, we discovered a way to measure flu evolution at a much higher resolution than was previously possible. This allows us to clearly see what is going on, a little like looking down a microscope for the first time and getting to see this previously confusing obscure world clearly. Second, we figured out that of the trillion possibilities of what could be the next type of flu, only about 140 of those possibilities matter. That’s few enough to make and test in the lab, and when we do this we find that the number (to everyone’s surprise) reduces to just one or two because many are equivalent to each other in terms of which is used in a vaccine.

And third, using an extension of the system for seeing the flu evolution at high resolution, we can also see how our immune system is responding with much more clarity than before. We now see that when we are vaccinated or exposed to flu, we don’t only generate immunity against the new strain, but we also boost our immunity against all the older antigenic variants we have seen in the past. We can vaccinate with a ‘future’ strain, to protect against a future virus, and even if we get the prediction wrong, it will be no worse than a traditional vaccine against the current virus.

Can we really make strains of flu in the lab before they exist in nature, and vaccinate people with these strains to protect against what the virus will do next? Hubris? Perhaps. And this leads me to my favourite quote in all of science by Max Perutz: “In science, truth always wins”. Clinical trials of this new type of vaccine will start in 2019. We will find out.

We are always looking for scientists to join our eclectic research group: zoo.cam.ac.uk/directory/derek-smith
Seventy years of independence. Seventy years of democracy. Dr Manali Desai asks what the world can learn from India.
This year, India celebrates 70 years of independence – 70 years of democracy. The next 70 years, I hope, will see a blossoming of the nation. What I don’t expect to see is stasis.

In the West, commentators are apt to think of democracy as an unchanging phenomenon. And yet, today, the world’s oldest democracies are in flux. From the rise of populism, to the rise of the far-right fringe, 2017 looks like it will be a turbulent year for Western democracy. And in the world’s largest democracy, India? In India, history shows that democracy is a journey, not a destination, something that Western democracies are perhaps beginning to experience. So what does India’s recent history have to say about the nature of democracy – both its own and others around the world?

Three years ago, Narendra Modi was elected in a landslide victory, defying pundits’ odds. His support from extreme elements within the Hindu nationalist party complex (BJP and RSS), and his leadership of Gujarat during some of the worst religious violence ever seen in India, seemed an unlikely winning formula in a country with such religious and ethnic diversity. Although Modi denies and was subsequently cleared of all charges, allegations of direct involvement by his party members continue, and thus far two senior BJP leaders have been found guilty. Yet, like Trump, he has emerged from these events relatively unscathed.

However, just 10 years ago, a very different combination of social constituencies were claiming the centre ground. The Congress Party was pushed to a historic victory on a wave of support that included lower-caste groups, poorer sections of the population and a plethora of social movement organisations fighting for basic needs in the language of human rights. During its 10 years in power, Congress implemented a range of social policies such as food security, employment guarantee, healthcare and education, which had a direct impact on reducing poverty.

But nowhere is the struggle inherent in democratic politics more evident than it is in India. The centre did not hold. Today, there are many reasons to worry that India is on a path towards becoming a hardline Hindu nationalist state. Under Modi’s leadership, the political rhetoric is shifting – while on the ground there is evidence of sustained radicalisation in school textbooks and educational appointees. And yet despite this, there is no clear opposition to the dominance of the Hindu right. Regional caste parties may hold the balance of power in states, but the BJP is undoubtedly the major national party.

HYDERABAD, TELANGANA.
Previous: Y.S. Sharmila (YSR Congress), daughter of former Andhra Pradesh chief minister, the late YSR Reddy, on the campaign trail.

TRIVANDRUM, KERALA.
Above: A group of ministers from the Kerala assembly mid-discussion during the campaign of Shashi Tharoor.
In India, democracy is a journey, not a destination – something that Western democracies are waking up to.
DR ANJALI BHARDWAJ-DATTA
Leverhulme Trust Early Career Fellow, Centre of South Asian Studies
My wish for the next 70 years of Indian independence is a just, tolerant, and freer India, where everyone, regardless of faith, caste, class, gender or sexuality, belongs equally. I wish for a healthy and literate India – free of violence, fear, hunger and suffering, with children attending schools, and more power to the girl child. I wish for an India where we do not see people on the streets, without a home or food. I wish for a green and safe India.

MITHUN SRIVATSA (WOLFSON 2011)
CEO, Blowhorn
One of our great strengths is our very diverse, boisterous democracy, and our unity. We need to continue working together to create one of the biggest demographic shifts of poor people to the middle class.

In the next 15 to 20 years, technology will play a key role in this. It has the potential to enable a lot of people to get out of poverty. I’m pretty sure we will make it happen, and it will be an exciting thing to see. Indians are great innovators.

And in terms of geopolitics, we need to resolve issues with our neighbours and take on a global leadership role and play that role with dignity and grace.

PROFESSOR HOWARD GRIFFITHS
Professor of Plant Ecology, Department of Plant Sciences
My wish is for a second green revolution, in which modern agricultural methods become more sustainable. While the first was a success in some key areas such as the Punjab, it relied on extensive use of water, fertiliser and pesticides.

We must work with communities and research organisations across India to ask: what do you need for agriculture in your region? How can we help to improve crops and empower communities to maintain productivity for the future?

DR NAYANIKA MATHUR
British Academy Postdoctoral Fellow at the Centre for Research in the Arts, Social Sciences and Humanities (CRASSH)
My wish? That India remains true to its founding principles of diversity, openness and secularism.

Globally, we are witnessing the diminishing of respect for difference and in the active support of dissent and deliberative argument. India distinguished itself early on in its life as a post-colonial nation state by strictly adhering to these principles in the face of seemingly insurmountable odds. It is of the absolute essence that India remains steadfast to these ideals and doesn’t descend into majoritarian authoritarianism.

So why have thousands of voters turned their backs on a social agenda aimed at benefiting them? It is certainly true that Congress, mired in a series of corruption cases, was increasingly unable to defend itself under public scrutiny. But corruption is far from the whole story.

During my field research in the state of Gujarat during 2012 and 2013, I talked to many lower-caste men and women about why they voted for the BJP – which has been in continuous power in Gujarat since 1995. This group has been key, locally and nationally, in the BJP’s success. And yet their support for the party runs counter to what mainstream theory
predicts, for it is clear that their life chances have not improved under BJP rule. I heard many complaints about the cost of living, the supply of water and electricity, police harassment of street vendors and growing inequality. Yet they still voted for the BJP. When challenged, the answer offered was simply that associating with the Congress party was anachronistic. To be modern was to advocate the aspirational values projected by the BJP (which it has done by employing the language of development). Traditional caste politics appealed less and less to these young men and women, who wanted to feel part of a modern, developing economy.

It’s not always ‘the economy, stupid’. Emotion plays a crucial role in democracy, as many commentators, such as Pankaj Mishra, in his book, the Age of Anger recognise. As in the US election, in Gujarat we saw a disconnect between the reasons our interviewees gave for their ongoing support of the BJP and their material circumstances. After almost 20 years of BJP government, interviewees reported that there were few secure jobs to apply for, that they lacked the networks possessed by upper-middle class applicants, and that educational and training opportunities felt out of reach. Life did not seem to be getting any better – if anything, it was less secure than what their parents had experienced.
My wish for India’s next 70 years is that it can become more capable of engaging robustly with the fault-lines – social, economic, and religious – that pervade various arenas, and that the unfinished task of weaving a nation through, with, and out of its fragments can be completed. That the nation-state of India, forged through the visions of Gandhi, Tagore, Ambedkar, Nehru, and others, will negotiate the binary of ‘East versus West’ neither by lapsing into a nativist glorification nor by diluting its concrete richness in a faceless universalism.

India Unboxed

Marking a 150-year long relationship
The University is marking the 70th anniversary of Indian independence with a season of activities which celebrate Cambridge’s long-standing and deep-rooted relationship with India. The centrepiece of the year’s activity will be India Unboxed, a programme of exhibitions, events, digital engagement and installations. Anchored in the University’s collections, the programme will explore themes of identity and connectivity for diverse audiences in the UK and India.

The University has more than 100 collaborations with Indian organisations, NGOs and businesses and 85 collaborative research partnerships across India, finding local solutions to global issues, from arts and humanities, to entrepreneurship, to sciences and technology. Four major joint UK-India centres are working on projects including anti-microbial resistant TB, crop science, cancer research and nanotechnology.

The contribution of Indian academics, alumni and students over many years is, of course, immeasurable. Notable alumni include: three Indian Prime Ministers, Jawaharlal Nehru, Rajiv Gandhi and Manmohan Singh; cricketer Prince Ranjitsinhji; mathematician Srinivasa Ramanujan; entrepreneur Lord Bilimoria; and scientist and humanitarian Dr Yusuf Hamied. Distinguished academics include Professor Sir Partha Dasgupta (Economics), Professor Ashok Venkitaraman (Cancer Research), and Nobel laureate Sir Venkatraman Ramakrishnan (Molecular Biology), to name but a few.

Vice-Chancellor Professor Sir Leszek Borysiewicz said: “There has never been a better time to engage with India’s culture, its knowledge, science and technology, its worldview and, above all, the talents of its people.” www.india.cam.ac.uk.
But nonetheless, to vote for the BJP was to be in favour of development and economic advancement.

They were not merely irrational – and nor are they alone. Trump’s victory in the US and the support he mustered from white working-class men and women was not based on fact-checking his record on providing jobs or improving their material circumstances. If we are looking for the source of such support, we might focus on the emotional responses of people who feel let down and whose disappointments, rage and even trauma fester in the flux of the democratic process.

Under these conditions, the lure of authoritarianism is tempting. It provides certainty where lack of direction prevails, it empowers those who feel weak and victimised by creating enemy scapegoats, and the mere promise of a better future can resonate with our aspirations in a way that makes the separation of rhetoric and reality a nuance. But rather than see this as a blip, a wrinkle in the fabric, I think we need to recognise that authoritarianism can nestle within the broader contours of democracy, because democracy itself is constantly changing.

Over the past 70 years, despite the vast inequalities that predated the advent of democracy, Indian democracy has steadily deepened. Excepting one brief spell of Emergency Rule (1975-77), India has largely escaped the experiences of authoritarian rule that has plagued countries even after they have gone down the democratic route. This outcome has rightly surprised many observers. Democracy in India survives – some might say it is in rude health – but it has done so only through trial and accommodation with a culture of inequality and unchecked power. These have left the country simultaneously weakened, and strengthened – something that the rest of the world may well be about to experience.

Democracy in India survives – but it has done so only through trial and accommodation with a culture of inequality and unchecked power.

Dr Manali Desai is a University Lecturer in Sociology and Director of Studies at Newnham.
**THE WORLD IS RUN BY...**

*Not really. But in a world of alternative facts CAM explores the truths and almost-truths behind why humans are so susceptible to conspiracy theories.*

WORDS VICTORIA JAMES ILLUSTRATION SÉBASTIEN THIBAULT

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**THE CIA**

Did the United States fake the moon landings? Did UFOs land in Rendlesham Forest? Were the 9/11 attacks a CIA plot? You doubtless have a simple response to these questions. One that’s just three letters – or, more likely, two letters – long.

But how about this assertion: the world is ruled by a powerful and secretive cabal? Suddenly, those one-word responses don’t fit quite so easily. The world may not be run by a cabal of illuminati. Or alien lizards. But there is an elite – the world’s top politicians and most powerful corporations – whose decisions affect the lives of all of us. And yes, even in this age of transparency, many of their meetings and decisions are conducted behind closed doors.

So where does rational observation end and conspiracy theorising begin? If only it were that simple. “We think there’s ‘conspiracy theory’ and then there’s acceptable political discourse,” says political scientist, Professor David Runciman. “But the difficulty is that there’s no clear dividing line where you can say, ‘We question it to this point, and beyond that questions are crazy’.”

Runciman is a director of Conspiracy and Democracy, a five-year, Leverhulme-funded project based at the Centre for Research in the Arts, Social Sciences and Humanities (CRASSH) that is drawing together researchers across disciplines to assemble a ‘natural history’ of conspiracy theories. He offers a succinct definition. “In the pejorative sense, a conspiracy theory is a view about the world in which the surface story is never the real story. It’s a view without any limits to its scepticism or doubt. It’s a mindset in which nothing that contradicts the theory is taken as anything other than evidence that the theory is true.”

Such sceptical mindsets are currently grabbing headlines, with narratives around ‘fake news’ and ‘alternative facts’.

“There’s a conspiracy-theory scare right now,” says Runciman. “But you can’t blame digital technology for this. For people who want to bypass conventional sources of information, it’s easier to do it. But the propensity of people to believe these things isn’t a modern phenomenon.”

Historian Dr Andrew McKenzie-McHarg, one of the Conspiracy and Democracy project’s researchers, is examining when these theories emerged is a contentious question: “Some say antiquity, others the Renaissance. Others say the French Revolution, when we see the first modern conspiracy theories, around the Illuminati.” Whatever the answer might be, it was only in relatively modern times that...
Conspiracy theories, like more sanctioned forms of belief, are our attempts to craft an explanation of the world around us. And what’s crucial in determining whether those explanations are acceptable or not, is context. In many cultures, Fletcher says, it might be “perfectly reasonable” to believe that you were being communicated with by a godlike entity. Not so in Western society today.

Of course, diagnosable mental illness creates delusion and requires treatment. But as Fletcher points out, conspiracy theories arise from the processing of evidence in our brain, resulting in a conclusion that the majority of society does not share. And the opinions of that majority are formed in exactly the same way. “Beliefs are not the logical workings-out of evidence that we assume them to be – they are based on our own biases and assumptions.”

And sometimes, those assumptions lead us astray. One striking example has been analysed by Dr Richard McKay, a Wellcome Trust Research Fellow, whose co-authored study of the Patient Zero narrative of the AIDS epidemic received global attention last year and appears in monograph later this year.

Among the study’s revelations was the fact that Patient Zero (an Air Canada flight attendant named Gaétan Dugas) was not the source of the outbreak, and that his designation as ‘zero’ or ‘0’ was a corruption of his abbreviated identifier in an early study as patient ‘O’ – a study subject who resided ‘Outside of California’.

McKay echoes Fletcher’s assertion that bias and assumption are instrumental in creating beliefs – in this case, an entire hypothesis about the origin and spread of the AIDS epidemic. “When epidemics arise, there is a long history of trying to find out the first cases. Overlapping with that, there have always been people trying to figure out, ‘How do we stop this?’ And then there’s another group focusing on ‘Why did that happen?’ and ‘Who can we blame?’ To an extent, which of those stories you subscribe to will depend on your world view, and which systems of belief and power you subscribe to.”
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Sidney Sussex  St. Catharine's  St. John's  Trinity  Trinity Hall  Westminster
He believes the Patient Zero false narrative wasn’t a conspiracy theory, but rather a demonstration of how chosen narratives can win out over evidence, and an argument for the care with which we need to craft our explanations. This tendency partly explains why conspiracy theories are so very hard to disprove or dislodge: they are self-reinforcing, thanks to the information chosen for consideration in the first place.

Understanding – and disseminating – how evidence can be used better is the task of one of Cambridge’s newest bodies, the Winton Centre for Risk and Evidence Communication, based in the Faculty of Mathematics. Executive Director, Dr Alexandra Freeman, says the centre is tasked with aiding key decision-makers and communicators, such as civil servants, doctors and journalists, to better grasp the evidence they use, and present it more effectively to their audience.

This could not be more relevant in 2017. It is a truism of the past year in politics that those responsible for clearly communicating evidence have failed to do so – or failed to cut through when they did. The 2016 EU referendum saw Michael Gove declare that “people in this country have had enough of experts”, while in the US presidential race, both the media and the public were fascinated by Donald Trump’s fluid use of fact. And in the wake of that acrimonious race, terms such as ‘post-truth’, ‘post-factual’ and ‘fake news’ have entered the mainstream. The need for a centre such as the Winton has never been clearer.

“I don’t think we can deal with conspiracy theorists directly,” Freeman explains. “There will always be those who don’t trust anyone, even the University of Cambridge’s Maths Department! Obviously we can try to establish our credentials for being trusted by being honest about everything we do, being open about the levels of uncertainty and disagreement in the evidence we are presenting, and providing reference sources for all our information.”

Which is why Dr Nayanika Mathur’s fieldwork at CRASSH is so intriguing – she is studying the contrasting attempts to introduce biometric ID in Britain and India. In the UK, the proposals were scrapped in 2010; in India, the UID (Unique Identification project) is proceeding despite opposition.

“The [Indian] government has branded much criticism of the UID as conspiratorial,” Mathur explains. “Yet at least some of the criticism is being levelled not by crackpots, but by respected legal minds and grounded activists. By taking seriously the so-called conspiracy theories around the UID, I am attempting to unsettle the common understanding of conspiracy theorists as deluded or crazy. That means I can look at conspiracy theories as critical commentaries on the world, from which we can learn a lot.”

We live in an age when even scientists investigating an epidemic can get the narrative wrong, and in which those who govern us often fail badly at communicating their evidence-based arguments. Meanwhile those labelled conspiracy theorists, says Fletcher, may reach conclusions that run counter to the mainstream, but, in shaping – and warping – the evidence to fit their strong beliefs, they are not doing much different from what we all do, all the time. The danger arises when they don’t accept facts that counter these beliefs, and stick to their own ‘alternative facts’. So, should we stop writing off conspiracy theorists, and instead view them – as Mathur does – as offering a critical commentary on our times? From Illuminati to ID cards, the latest crop of Cambridge research suggests that the history of weird ideas says as much about all of us, as it does about the people who believe them. conspiracyanddemocracy.org
Thomas Malthus, the great population theorist, is being reinvented for our times.

NEWTONIAN, DARWINIAN, KEYNESIAN: WHEN THINKERS’ NAMES BECOME ADJECTIVES, IT’S A SIGN THAT THEIR IDEAS ARE LIKELY TO OUTLIVE THEM. AND SO IT IS WITH THOMAS ROBERT MALTHUS: ENGLISH CLERIC, FELLOW OF JESUS COLLEGE, AND AUTHOR OF ONE OF THE MOST FAMOUS BOOKS EVER WRITTEN ON POPULATION.

PUBLISHED IN 1798, THE FIRST EDITION OF HIS ESSAY ON THE PRINCIPLE OF POPULATION PROVOKED PASSIONATE DEBATE. IT WAS “ONE OF THE GREAT SCIENTIFIC AND LITERARY CONTROVERSIES OF MODERN TIMES” AS PROFESSOR EMMA ROTHSCILD, DIRECTOR OF THE JOINT CENTRE FOR HISTORY AND ECONOMICS AND FELLOW OF MAGDALENE, POINTS OUT.

WILLIAM COBBETT LABELED MALTHUS A “MONSTER”. SAMUEL TAYLOR COLERIDGE CALLED HIM “STUPID AND IGNORANT”. WILLIAM HAZLITT’S RESPONSE RAN TO AN ASTONISHING 400 PAGES. CONVERSELY, CHARLES DARWIN AND ALFRED RUSSELL WALLACE CREDITED MALTHUS WITH KINDLING THEIR IDEAS ON NATURAL SELECTION, IN A WAY “ANALOGOUS”, WROTE WALLACE, “TO THAT OF FRICTION UPON THE SPECIFICALLY PREPARED MATCH, PRODUCING THAT FLASH OF INSIGHT”.

AND SO IT CONTINUES. NEXT YEAR, THE ESSAY WILL BE 220 YEARS OLD. PEOPLE CONTINUE TO LOVE »
to hate Malthus, despite – or perhaps because of – the fact that time has eroded his text into a gloomy central tenet. Today, it would seem that everyone knows what Malthus brings to the table: a simple argument that overpopulation is a bad thing. But is that really how we should understand his work and the controversy surrounding it? Or could his ideas help us address the challenges of the Anthropocene – an epoch of climate change, food insecurity, austerity and inequality?

Malthus’s Essay spanned several editions and several hundred pages, evolving from a primarily philosophical work into works of demography. In it, he presented evidence for a natural law that population increases faster (geometrically) than food supply (arithmetically), a system acted upon by ‘positive’ and ‘preventive’ checks including famine, disease and birth control.

Alison Bashford – Vere Harmsworth Professor of Imperial and Naval History and Fellow of Jesus (whose recent book, co-authored with Joyce Chaplin, radically recasts the Eurocentric view of Malthus) – admits she’s fascinated by him.

“In his own time, the controversy was theological and doctrinal, as much as anything else,” explains Bashford. “Malthus seemed to suggest that on one hand, God would not provide, and on the other, that going forth and multiplying was not always a sensible thing to do. Later, the controversy was more political, related to his objections to the Poor Law and the state’s maintenance of the poor. This is the origin of the ‘unfeeling’ Malthus.”

As a strong defender of the economic benefits of inequality and a critic of poor relief, Malthus seems ever present in debates about the welfare state. “For much of the 19th and 20th centuries the adjective ‘Malthusian’ basically meant contraception, and the word ‘Malthus’ has come to indicate a way of speaking about deep fears of other people,” says Rothschild. “[But] one of the contemporary issues that was very important when Malthus was writing – and that is very relevant now – concerns what would now be called social security.”

Today at Jesus, Dr David Nally and Dr Duncan Kelly both hear echoes of Malthus in their own research. Kelly is writing a book on the Great War and the origins of modern politics, an attempt to take seriously John Maynard Keynes’ belief that ideas are what change the world – and Keynes has led Kelly straight to Malthus.

Keynes’s Malthus was first and foremost an economist, says Kelly. He responded to the Napoleonic wars and crises of corn production, post-war debt, and the relationship between wages, profit and land use. “If you fast forward 100 years, Keynes is trying to understand the relationship between debt, finance, and the production

Could Malthus help us address the challenges of the Anthropocene age – an epoch of climate change, food insecurity, austerity and inequality?
and consumption of food during and after the First World War, so it’s not surprising that in 1912 and 1914 Keynes turns back to Malthus,” he explains.

On the other side of Jesus’s Second Court, Nally – a human geographer and 19th-centuryist interested in subsistence crises – also finds Malthus relevant to his research on the Great Irish Famine.

Many people who intervened in the political debate before, during and after the famine use Malthus as a way to explain what occurred: that a population boom and not enough land coupled with an ecological crisis and repeated failures of the potato harvest caused mass starvation.

“I was interested in complicating that picture,” says Nally, “seeing it less as a story of aggregate numbers of people and absolute scarcity, and more about the conditions that underwrote population growth, the landholding situation and thinking more carefully about relative scarcity. That’s not to minimise the catastrophic nature of the destruction of the potato harvest – but not a single landlord died during the famine.”

Nally likes to remind his students that the world produces more than enough food to feed the population. “It’s clearly not just a question of population,” he says. “But what is true – and perhaps is Malthus’s unique contribution – is seeing population as a unique actor in its own right. That’s very powerful because it lets you see large-scale problems and phenomena. In social science, as we move into big data, that’s very appealing.”

However, his desire to complicate can sometimes frustrate others in the Cambridge Global Food Security Initiative. “My plant science colleagues want to create new tools, but tools are embedded in a social context,” he says. “Plant scientists always tell me that social scientists have a problem for every solution!”

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The other side of the equation – our consumption – matters too. “We need to look at our own appetite for food: how much we need and what kind of food,” says Nally, “particularly in the West, as we consume more and more meat and adopt diets that place further burdens on global agriculture.”

The same can be said of climate change, which, in altering growing conditions in places already struggling with poverty, will hamper people’s ability to subsist and create potentially explosive social conditions.

“I feel a sense of déjà vu here. Malthus is writing in 1798. There are revolutions and rebellions in the 1830s and 1840s,” says Nally. “Today, people are talking about the same things, except climate change is the underlying factor, coupled with the amount of people who now need to subsist.”

Could it be, then, that the relevance of Malthus’s ideas ebb and flow according to the fall and rise of crises? According to Kelly: “Malthus talked about these cycles, especially in relation to famine, poverty and population. He’s not gone out of fashion because he fixed our attention on a problem that obviously pre-dated him – but which shows no signs of going away.”

And as the daily gloomy global news highlights radical divisions between rich and poor, Malthus gives us something to work with. “He gives us a perspective from which to explain some of these major global flows – migration, population, food production and distribution. He was – and remains – important for economists interested in tracing these flows across the world,” Kelly concludes. “He gives us a perspective on these problems. He doesn’t give us solutions – but then who does?”

THE CAMBRIDGE GLOBAL FOOD SECURITY INITIATIVE
With global population set to reach nine billion by 2050, food security is one of this century’s greatest challenges. But what does an ideal food system look like? It’s a question that Cambridge is determined to address. The Cambridge Global Food Security Initiative, chaired by Professor Chris Gilligan and Professor Howard Griffiths, is a virtual network of researchers focusing on sustainable production, resilient and efficient processing, distribution and supply and ethical and healthy consumption. Together, Cambridge crop scientists, engineers, economists, policy and public health experts are working to deepen our understanding so that the world can develop better solutions.
In 1999, Dr Michelle Oyen was a bioengineering student, working on a PhD project to measure the stiffness of bone, when the phone rang. It was Dr Steven Calvin, an obstetrician at the local hospital. “I’m trying to understand some issues around miscarriage and premature birth,” he said. “Is there someone there who has a machine that can stretch things, and make measurements of how strong something is?”

Calvin had a specific question: he was performing a procedure aimed at keeping a prematurely opening cervix closed by putting stitches around it. If a cervix opens too soon, it can result in premature birth. During the procedure, antiseptic is painted around the area, including the amniotic sac. He wanted to know if this substance changed the properties of the sac, making it more likely to rupture.

Oyen, now Reader in Bioengineering in Cambridge’s Mechanics and Materials Division and the Biomechanics research group, was fascinated by the idea of applying engineering thinking to this problem. “I was carrying out my experiments in a housekeeping cupboard in the hospital,” she remembers. “I had a rig for strength-testing the amniotic sac. I’d get a call from Dr Calvin that a woman in labour was happy for us to use the sample, I’d grab my rig and set it up in a cupboard down the hall from the delivery room.”

Their first investigation into this question resulted in a paper published in the Journal of Material Science: Materials in Medicine, and sparked what Oyen calls her life’s work: finding out why pregnancies go wrong. “Three per cent of the time, the amniotic sac breaks for no reason that we know,” she says. “That can cause miscarriage, or stillbirth if it’s before viability. Even after that, babies born between 25 and 30 weeks are very premature and so their outcomes are very poor. Even babies born after 30 weeks are still not fully ‘cooked’: you have to get to 37 weeks before we consider you to have made it to the end line. These problems happen in the developed world, even when we have so much technology around us. In the developing world, there’s a whole other set of issues. So when you talk about problems in pregnancy, you’re talking about a big chunk of humanity.”

There’s a long and honourable history of collaborations between engineering and medical science, from designing cutting-edge prosthetics to creating technology for robot-assisted surgery. Yet, says Oyen, looking at pregnancy in this way is an area that’s 20 or 30 years behind, say, orthopaedics. “Most of the time, pregnancy kind of works and doctors know how to manage something that goes wrong – but they don’t always understand why it’s happening. It’s something that we fundamentally don’t know about. And that really excites me.”

What makes pregnancy problems so ripe for exploration by engineers? The tools, says Oyen – namely, computers. “You can’t do experiments on pregnant women,” she points out. “It is completely unethical. But with computers, we can make a virtual model of the placenta. There’s potential for huge progress there.” One of her team’s recent projects, which gave rise to a paper published in the journal Placenta, is based around images of real placentas taken using a confocal microscope at a very high resolution. These images are then turned into 3D computational models. Oyen and her team can then model how the blood flows through...
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the capillaries of the placenta, bringing oxygen from the mother to the baby. This will aid understanding of why the placenta sometimes malfunctions and fails to bring enough oxygen to the baby, meaning its growth is restricted.

That’s studying the placenta at full term: but its beginnings are also a rich area for research. When a fertilised egg implants into the uterus wall, specialised cells called trophoblasts must migrate in to help form the placenta, a biological process similar to how cancer cells metastasise. In collaboration with the Cambridge Centre for Trophoblast Research, Oyen’s team is studying how trophoblasts move, a unique cross-departmental group of pregnancy researchers. “The collaboration with others from the Centre has just been amazing,” says Oyen. “That’s the thing about Cambridge. You don’t find such a wealth of expertise anywhere else.”

Pregnancy problems are one of the Oyen Lab’s four main strands of research, the others being more traditional areas of bioengineering, including the creation of synthetic materials using inspiration from the natural world – studying materials such as eggshell and bone to find an equally strong and light material, for example. As any cook knows, Oyen says, an eggshell is actually pretty robust. If you want to break it, you need to hit it hard against your glass bowl. Yet it starts off as a squishy, watery membrane filled with yolk.

Given the right conditions – usually a chicken with average body temperature – it becomes a full egg with a hard shell in about 18 hours. This is a material that is 97 per cent ceramic but forms naturally in close to ambient conditions, and therefore is not energy-intensive – unlike concrete, which always involves high temperatures to process. These materials could have medical applications, such as replacing the metal and plastic currently used for new hip and knee joints, or they could even be scaled up to create anything from furniture to buildings: the lab’s current project on eggshell-inspired materials is funded by the US Army Corps of Engineers.

“Materials inspired by bone and eggshell are really good structural materials: why limit them to medicine?” Oyen says. “We can make bone-like material now, but only in lab quantities. It would take a big company to scale it up. Natural materials are really interesting. We build things out of steel and concrete now, but before we started getting the idea to do that, we built things with whatever was around us – wood or stone. People don’t really appreciate what impact this could have on global warming: in 2007, the creation of steel and concrete was responsible for more CO₂ emissions than the aviation industry worldwide. We demonise airlines without realising that building a skyscraper also makes a big contribution.”

Looking at the scope of her work, it’s hardly surprising that a glimpse at Oyen’s office bookshelf reveals a dizzying array of interests, from clouds to Russian dictionaries to Cary Grant – not to mention the electronic piano keyboard that stands next to it. “Yes, I have broad interests, which I think is normal for someone in such an interdisciplinary field,” she says. “A lot of my work is synthesising and bringing people together. Most of my students are co-supervised, most of my work is collaborative. I spend very little time sitting in a room, typing on a computer. I get people together. I talk to engineers and medics, I get biologists talking to

engineers. I’m the traffic cop in the middle, translating from engineering language to biomedical language.”

Her chosen path is partly personal, she says – Oyen has juvenile arthritis, which began in her teens. Her father worked in an engineering company and had her solving problems from the start. “My motivation is completely selfish,” she says with a grin. “My first degree was in Materials Science and Engineering, and while I was doing that, I twigged that there were medically related engineering applications. I was doing very traditional metallurgy. I had nothing to do with medicine. But when I was having a particularly bad bout with my joints, I started getting interested. I started coming across some of the very traditional approaches to solving medical problems, like total joint replacement, which goes back to the 1950s. You replace living tissue, which is 75 per cent water, with metal and plastic. That’s a very 1950s solution and yet we haven’t come up with anything better.”

There is a word in bioengineering – bioinspiration – which, within the context of the discipline, means a method of solving engineering problems using natural approaches. A bioengineer will systematically study how nature has solved problems and then try to map that method on to a current problem. Perhaps it’s not too much of a stretch to say that a kind of bioinspiration is at the root of everything Oyen does: taking both nature’s design flaws and extraordinary abilities – to regrow, renew and create life – as a starting point for making things work better, from carrying a child to creating a city.

“There is so much potential in all our work, but in the pregnancy work, I feel like it’s really just getting started,” she says. “High risk, high reward – and the reward is better outcomes for mothers and babies. It’s what engineering is all about: problem-solving. It’s creative. After all, the root of the word engineer is not engine, but ingenuity.”

To find out more about Dr Oyen’s work, visit oyenlab.org.
How do you get under the skin of an ancient Icelandic saga? Read it in situ, of course, as Dr Emily Lethbridge explains.

PHOTOGRAPHY BENEDICT REDGROVE

Noble warriors, scheming chieftains, lovesick poets, vengeance-inciting widows and malevolent ghosts are among those who feature in the 35 or so medieval Icelandic Sagas of Icelanders (Íslendingasögur). These sophisticated literary works, composed for the most part in the 13th century, tell the story of the late 9th- and early 10th-century settlement of Iceland and describe the often violent lives of the first generations to inhabit the island.

In 2011, I spent a whole year exploring the complex relationship between the saga narratives and the landscapes of Iceland today. The Sagas of Icelanders are entertaining and thought-provoking wherever and whenever they are read, but they are especially compelling when they are read out of doors, in their ‘actual’, often dramatic, landscape settings. I was by no means the first to discover this: among those who have embarked upon similar expeditions, the most famous is probably William Morris, who spent the summers...
of 1871 and 1873 visiting saga-sites around Iceland. As I investigated saga-sites over one century later, this immersive experience also impressed on me the importance of understanding the place of the sagas in the Icelandic cultural landscape, from the medieval period to the modern day.

The sagas are both national and local in focus, not least in their depiction of how a new society and political order was founded and the challenges of life in a new, and often harsh, environment, as well as in the way that their action is rooted in Icelandic geography. Most sagas take place in a specific area or district, and foremost among the sources drawn on by the anonymous authors of the sagas were oral traditions about the settlement and early history of the country, often linked directly to specific places in the landscape. As a corpus, the sagas are particularly noteworthy for the extent to which they are embedded in the topography of this northern Atlantic island.

Travelling around the saga sites resulted in my developing a new approach to the narratives: I began to read them out of the landscape and place names, as well as in printed format. I believe that this kind of in-tandem reading closely resembles the way in which Icelanders themselves would have accessed the sagas up until the 20th century. Indoors, people listened to the stories read aloud from manuscripts during the long, dark winter months; outdoors, the same stories were retold in their physical settings (the very contexts that generated them in the first place) as people moved around the local countryside. Place names and topography would trigger the recollection and telling or retelling of anecdotes that, collected together, comprised the written, ‘whole’ versions of these narratives.

The daily poring over maps that my fieldwork entailed fuelled a passion for place names and their dynamics. A new world opened up as I began to see how these narratives, in conjunction with place names, could be used to help navigate around a topographical area, the stories working with the place names to generate a mental map. Many sagas describe how, on arriving in Iceland, the settlers explore the new landscape and ‘map’ it, giving names to prominent landmarks (fjords, rivers, mountains, valleys etc) as well as to newly erected, man-made structures such as farmsteads. The giving of place names in the sagas (as in modern life) is a powerful strategy for transforming alien topography into familiar terrain. It can be interpreted as an act that was both practical and symbolic, aiding navigation both physically and emotionally, and reinforcing or legitimising human presence and ownership.

In the saga Egils saga Skalla-Grimssonar, a character called Skalla-Grimr (the father of Egil, the saga’s main protagonist) comes ashore in the west of Iceland and sets off with his followers to survey the local area. This part of the country, the Mýrar region, is predominantly low-land marshes (today mostly drained) and small lakes, rocky outcrops and hills, with mountains to the north and east from which rivers run down to the sea. The early 13th-century saga author’s descriptions of the landscape encountered by Skalla-Grimr are of interest for a number of reasons.

First, they draw heavily on place names as a source. In fact, the place names themselves communicate something of how the unfamiliar landscape may have been perceived by newly-arrived settlers. Some place names are descriptive: ‘Hvítá’ (‘White River’, a glacial river), or ‘Langá’ (‘Long River’); ‘Mýrar’ (‘Bogs’); ‘Borg’ (‘Rocky Hill’, the site by prominent outcrops of...
basalt rock where the family farmstead is built). Other place names have a narrative dimension and are said to have come into being to commemorate events or characters associated with specific places.

It is sometimes moot whether these place name explanations represent ‘genuine’ tradition or were invented by the saga author. Clearly, creating a story around a place name would have been an effective rhetorical device, binding the narrative more closely to the landscape and thus enhancing its authenticity.

Second, descriptions of the landscape in Egil’s saga (and other sagas) sometimes mention certain changes that the landscape had undergone between the settlement period and the period of saga-writing. The author of Egil’s saga states, famously, that when Iceland was first settled, it was covered with trees from shore to mountain but that at the time of writing, those native woods had disappeared as land was cleared for settlement and livestock-based agriculture. Timber in the sagas (whether native, imported or driftwood) is a precious resource, the disputed ownership of which sometimes sparks feuds. The motif of Iceland having been widely wooded prior to settlement seems to be both a literary trope and an articulation of environmental memory. Paleoenvironmental proxy data does support the fact that there was significant tree coverage prior to the late 9th century settlement and that woodlands did decline post-settlement – but it reveals a more nuanced picture than that found in the written sources, thus reminding us to exercise caution in taking descriptions of the landscape in the sagas at face value.

Third, with this caveat in mind, the saga gives an interesting picture of how natural resources that the first settlers came across in different parts of this area might have been utilised. In addition to his main farm at Borg (a little inland), Skalla-Grímr is said to have built smallholdings at other places where he could, for example, more easily access driftwood, row out to fishing grounds in the fjord, hunt seals and sometimes whales, catch salmon in freshwater rivers and collect birds’ eggs.

The saga also notes how he built a smithy at a place called Rauðanes (Raufanes in the medieval texts) by the sea at the southern tip of the same peninsula: here, the saga says that he dived down into the sea and came up with a stone large and hard enough to use as an anvil, since no other stone fit for the purpose could be found locally. The saga states that this unusual stone could still be seen at the time of the saga’s writing, its enormous size a testament to Skalla-Grímr’s great strength, with great piles of slag from his smithing activity lying around beside it.

Some 800 years later, while I worked on mapping Egil’s saga around the local area, Skalla-Grímr’s stone anvil was one of the things pointed out to me and it gave me pause for thought. Was it really ‘the’ stone mentioned by the saga author, or another one, designated as Skalla-Grímr’s stone much later? Why did people feel the need to insist it was Skalla-Grímr’s stone? Was there ever such a stone in the first place? As long as there was an impressive stone at Rauðanes that could be pointed at and identified as Skalla-Grímr’s stone, did it matter whether it really was ‘genuine’ or not?
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Locally, awareness of Egil’s saga today is relatively high. Street names in the biggest town in the area (Borgarnes, with a population of around 1,700) are based on saga characters’ names and the saga plays an important part in heritage tourism efforts in the area. As well as an exhibition at the Borgarnes museum which aims to retell the story to visitors, prominent cairns have been set up around Mýrar to mark a number of places named in the saga. Tourists are given a map with these places marked on it and they can listen to relevant chapters read from the saga as podcasts ‘on location’. This is the most modern manifestation of the saga’s reception via the landscape. As in previous times, the landscape mediates the story but today, as before, this is not a disinterested state of affairs, since the landscape is made to mediate the narrative by parties who all have political and/or economic motivations.

And, in this part of Iceland (as well as elsewhere around the country), while the identification of saga places and association of saga events and characters with present-day places make for an evocative experience, it is also a rather deceptive and romantic one. The sheer magnitude of the Icelandic landscape has a very seductive power. It can convey an illusory sense of timelessness and continuity that conceals the more complex and processual reality. As well as all of the changes that humans have been responsible for (draining and clearing of large tracts of land, building of modern roads and bridges, damming of rivers to harness their energy, to name a few examples), natural phenomena such as volcanic eruptions, earthquakes, retreating and advancing glaciers and glacial floods have, of course, also altered the appearance of the landscape over time – sometimes dramatically.

The compelling desire to map the literary texts directly onto today’s landscape, to identify saga places with places bearing the same name today, can lead one to overlook the more interesting disjunctures: instances where place names have moved, for example, perhaps when an original settlement was abandoned after a volcanic eruption but rebuilt somewhere else and given the same name. I have begun to think more about the gaps, the stories involving people and their physical surroundings that were not put down in writing, the place names which have no explanatory anecdote told in full in a textual source.

Iceland offers countless opportunities for investigating the stratigraphy of narratives, both old and new, embedded in its spectacular landscape. The challenge is to find ways of unearthing them, retelling them, and using them to help us understand the nature of the relationship between human culture and physical environment in our own, unpredictable, times.

Dr Emily Lethbridge (University of Iceland) undertook her research after completing a Research Fellowship at Emmanuel. Her book Iceland: Land of Rock and Saga (Crymogea) will be published this year.
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Many potential pitfalls await the unwary Cambridge fresher, not least the conundrum of bread roll ownership at formal dinners. “I remember being very confused as to which one was mine – left or right?” says third-year historian Jess Lister. “And not being sure which cutlery to use. Your College family helps with these little stresses.”

Lister is College mother at Emmanuel, along with College father, third-year medic, Richard Johnson. Every year, pairs of third-years across the University volunteer to be College parents – forming a College family. It’s a long-standing tradition, but one that isn’t immune to change: at Emmanuel this year, pairs of same-sex parents were given families.

Families are given their children’s contact details before they start and are encouraged to get in touch. “We set up a Facebook group to get in touch, and told them things we wished we’d known when we were starting,” says Lister. “Mine were: don’t panic about buying tickets for things before you arrive, and if you’ve got a bike, bring it!”

In the first week, parents help newbies move into their rooms, and take them for lunch, and on a tour of the College. They’re there to answer any questions, whether that’s the best place for lunch or how to go about getting the right gown for matriculation.

First-year English student Seb Shuttleworth is one of Lister’s ‘children’. “When I arrived, Jess helped me move in and gave me a quick tour,” he says. “She was very good at giving me a general feel for the place in the first week. Going to Cambridge is intimidating for anyone, but my College family made it a very easy transition.”

The family has met up two or three times since, but there’s no pressure to be best friends. The system works because it’s not overbearing, says Lister. “My own College parents were such a help when I started. Our role is pretty important in the first few days. But by the end of the first week, our children found their feet – though, of course, we’re always there to point them in the right direction.”
I wound up hunting down the author and applying to work in his lab.

Professor David Rowitch is Head of the Department of Paediatrics.

The Wnt-1 (Int-1) Proto-Oncogene is Required for Development of a Large Region of the Mouse Brain

Andrew P McMahon and Allan Bradley, 1990, Cell

This paper influenced me not only intellectually, but also personally and practically, because I wound up hunting out the author and applying (successfully) to work in McMahon’s lab using the technique he’d written about. At the time I read it, I was really interested in using a technique called ‘gene knockout’ (whereby individual genes are removed from mice to see what the mutation results in) to study the effects on the development of the brain. The problem was that many individual genes wound up compensating for others. But this paper showed that the removal of one particular gene called Wnt-1 was critical for the development of a mouse brain because the knockout mouse lacked a large region of mid- and hindbrain. The paper quite literally changed the course of my career.

What with Brexit and Trump it could hardly be more relevant.
The theatre was full. I still remember the buzz of the first night.

*John Fulljames* (Christ’s 1993) is Associate Director of Opera for The Royal Opera.

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**RATS, LICE AND HISTORY**

*HANS ZINSSER*

This book, which traces the history of Western civilisation through the lens of the microbiologist, is read much less today than when it came out in 1935 and yet it’s such a thought-provoking read. In it, Zinsser clarifies that man’s destiny has been controlled by microorganisms. For instance, the Black Death had a determining role in shaping medieval society and typhus determined the outcome of many important battles. I was a medic training in paediatrics when the head of the hospital I was working at chose this as his book club choice and I’m really grateful as it’s so stimulating.

**ST JOHN PASSION**

*JOHANN SEBASTIAN BACH*

I read Natural Sciences, but my real passion at Cambridge was singing. I particularly remember a performance of this in King’s Chapel, with an early music orchestra and an outstanding set of soloists. Music-making at Cambridge was so inspiring – discovering a new repertoire and taking huge pride in performing it as well as you possibly could.

**THEY CAN’T TAKE THAT AWAY FROM ME**

*LOUIS ARMSTRONG AND ELLA FITZGERALD*

I was introduced to this during my first term and it opened up a new world of jazz for me. This song reminds me of that amazing freedom you have at university to stay up listening to music well into the early hours, making crazy amounts of noise.

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**L’ELISIR D’AMORE**

*GAETANO DONIZETTI*

In my final year, the Opera Society staged this at the Cambridge Arts Theatre. It was a massive moment in the move away from physics into music and theatre. I can still remember the buzz of the first night. The theatre was full and it was thrilling to see their responses. Theatre really can be a transformative experience and only makes sense when there is an audience. This project really taught me that.

**ST QUOARTETT**

*directed by John Fulljames, will be performed at Spoleto Festival, Charleston, South Carolina on 31 May and 3 June 2017. spoletousa.org.*
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Cambridge is a global university

Professor Eilís Ferran, Pro-Vice-Chancellor for Institutional and International Relations, reflects on Cambridge’s role as a global university.

What does it mean, today, to be a global university? Does it mean that a university reflects global diversity, or that it addresses global issues? Is it about building global partnerships, or about demonstrating global leadership?

It is, of course, all these things. The University of Cambridge is an international hub. Our 19,000-strong student body includes almost 8,000 international students from more than 120 different countries. They make up nearly a quarter of our undergraduate population, and nearly two-thirds of our postgraduates.

Close to 15 per cent of our staff (and at least one-third of our researchers and lecturers) are from outside the UK. Two-thirds of all our postdoctoral researchers are from overseas. The University has upward of 100 registered international societies. Our Language Centre provides teaching and resources in more than 170 languages.

At the same time, the University of Cambridge has a very significant global presence. We have research collaborations in more than 135 countries (65 per cent of Cambridge’s publications have international co-authors). We are at the centre of a network of more than 450 volunteer-led alumni groups in 115 countries – the widest-reaching network of any university in the world, bringing together almost 60,000 overseas alumni.

Beyond the numbers, our diversity is reflected in the willingness to acknowledge a multitude of world views, and to integrate the full range of talent available to us – regardless of nationality, gender, sexual orientation, ethnicity or financial capability.

We are also a truly global university because we address global issues. Whether it is food security or energy sustainability, whether it is the threat of climate change or the realities of mass migration, the challenges we face are international – and so, too, will be the solutions. Infectious diseases are not bothered by borders. Regardless of whether we are in Cambridge or Cape Town, we are all affected by the problems of ageing societies.

A global university like Cambridge must establish global partnerships. Collaboration between universities – within countries as well as across borders – is no longer optional. In an age of diminishing resources, and as the scale and complexity of the challenges increase, collaboration is a necessity.

World-class research is a global project. Truly global universities are those able to harness the power of strategic partnerships – with other universities, with businesses, with civil society, with governments.

A final qualification is the ability to take on a role of global leadership. Despite the perceived breakdown of public trust in institutions, research universities may be among the few institutions with the means and the legitimacy to bridge the gaps between different disciplines, between different sectors of society and between different cultures. This legitimacy gives a university like Cambridge a convening power unlike anyone else’s – and also a tremendous responsibility.

Cambridge is well placed to discharge its global leadership responsibility. This requires confidence, creativity and close cooperation. It also requires the humility to acknowledge that we cannot contribute to society on our own.

We have just marked a full year of fruitful collaborative research with partner universities and government agencies at the Singapore-based Cambridge Centre for Carbon Reduction in Chemical Technology. Our Cambridge-Africa Programme, the University’s flagship capacity-building initiative, continues to thrive. In the year of the 70th anniversary of Indian independence, Cambridge will celebrate its close ties to India’s institutions and researchers through a year-long programme of events, including a series of exhibitions in the University’s museums.

In an increasingly unsettled world, Cambridge is more open than ever to talented people and excellent ideas from around the globe.
INSTRUCTIONS
The wordplay in 17 clues leads to the answer with one letter missing. When viewed in the preliminary grid in normal reading order these letters spell out a title. In the remaining clues the wordplay leads to the answer with an extra letter not to be entered in the grid. In clue order these letters spell out what must be deleted, its replacement and what must be highlighted. All final grid entries are real words.

ACROSS
1 Complaint about caging northern reptile (6)
5 A Dutch seaman receiving five hundred goodbyes (6)
10 Exhilarated English boy taking ecstasy (6)
12 A westbound threesome following Morag’s direction (4)
13 John stopping British plot made a big mistake (6)
14 US city’s singular tree (5)
15 Virgina’s brother runs into porter (4)
17 German chemist managed to enter lodge (6)
19 European provisional making inroads (6)
21 Organised numerologists initially need a basic assumption (6)
22 Sweet millet (6)
25 Chase eastern doctor in front of pitch (6)
29 Goddess close to unstable Indonesian chief (6)
30 Brother learnt complicated French dance (7)
33 Find a way through shut garden devoid of good ground (8)
35 Long-tailed bird trapped by popular Scotsman (4)
36 Alliance sacking Liberal whip, now obsolete (6)
37 Policewomen wrongfully featuring in boastful talk (5)
38 Dusty song meeting required standards in Helena’s state (4)
39 Soccer team’s base for the first of nine old-fashioned receptions (6)
40 Fool entertaining spiteful gossip about some swimmers (8)

DOWN
1 Bachelor banged up was loquacious (6)
2 Laxative prepared with skin of olive and sulphur (5)
3 Servant turned up with book keeper (3)
4 Rising tide drowning river insect (5)
5 Revered agent standing up after a celebration (6)
6 Italian lady almost exhausted flattering fan (5)
7 Lucifer and the sun in poetry maybe organised as a study out of university (8)
8 Rita was his second wife, getting drunk pursuing men (5)
9 Sun cheers Aberdeen’s cowshed? (4)
11 Kazak’s fat engineer joining assurgent party (6)
16 Opportunity of member wearing jumper (4)
18 Afternoon over soon (4)
20 George at grammar school with curious knowledge of earth materials etc (8)
23 Comparatively quick walker crossing island (7)
24 NZ bird’s small cases (5)
26 Cloth rag put over a large tuber (6)
27 Most wily Scottish golfer turned up with support (6)
28 Black mostly keen sheriff’s officer (6)
30 Expert comic actors (5)
31 Trustee and second son pack up (5)
32 Area in underlying surface cleared (4)
34 Independent nurse from the south dated duke (4)

SOLUTION TO CAM 79 CROSSWORD
MISSING BY SCHADENFREUDE

AMELIA EARHART (central column, cells initially empty) and her navigator FRED NOONAN disappeared during their round-the-world flight leg between NEW GUINEA and HOWLAND ISLAND (bold italics). Changed entries are FEAR, RAGES, ETA, DONE, HON, TARO, GEO, MEAN, VILLA and SEEN, the changed letters (highlighted for information only) spelling FRED NOONAN.

Winner: David Groombridge (King’s 1984)
Runners-up: Michael Barker (Caius 1966), Glynn Gardner (Jesus 1971)

Do you revel in the complexities of our crossword or are they one cryptic clue too far? After eight cryptic years, we’d love to hear your thoughts on the crossword. Write to us at: cameditor@alumni.cam.ac.uk
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