

Mother of parliaments: does
democracy need a reboot?

How an ingenious new device
could transform cancer care.

Uncovering pandemic secrets
from early-modern Japan.



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Cambridge Alumni Magazine

Lent Term 2021

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Editor's Letter



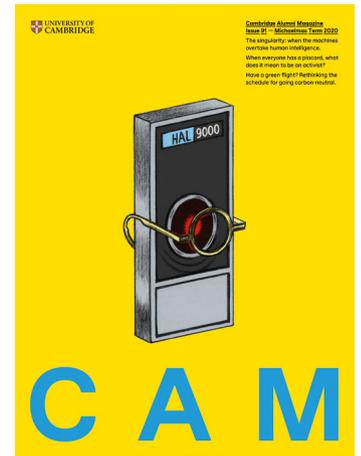
Welcome to the Lent Term edition of CAM. As I write this, countries are discussing vaccine sharing – and hoarding. Hard borders seem more relevant than ever before. But as the world closes in, many of us long to explore different places, cultures and ways of being. And so, on page 24, we report on the work of Professor Esra Özyürek, whose research explores the experiences of German Christians who have converted to Islam – and of Muslims who have migrated to Germany.

Closer to home, assessments of the UK government's performance over the past year are stacking up. But what if the system itself stands in the way of success? On page 12, we explore whether, after 750 years, the mother of parliaments needs reform – and on page 30 we examine why government procurement (whether of lunches or PPE) so often goes wrong.

Finally, some unadulterated good news. Professor Rebecca Fitzgerald has invented an ingenious device – a cytosponge – that has the potential to transform cancer care. Her work is truly revolutionary, and on page 34, we tell the story of how a passion for understanding and then solving intractable problems led to a ground-breaking discovery.

On these topics – and on all things Cambridge related – we look forward to your contribution to the debate, online at magazine.alumni.cam.ac.uk, by post, email or on social media.

Mira Katbamna
(Caius 1995)



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Inbox

Batteries

✉ David Odling (CAM 91) is quite right to raise the important, and often overlooked, point about the poor energy density of batteries. Since the original lead-acid car battery, which has been in use for well over 100 years, energy density has improved roughly six times to get to today's lithium batteries. Unfortunately, to match hydrocarbon fuels, the lithium battery would need to improve a further 30 times.

Barry Dawson
(Trinity Hall 1973)

Fitzbillies continued...

✉ As an American student at Cambridge in the 1970s, my favourite place in town was, of course, Fitzbillies. When my parents visited during my first year, we feasted on Chelsea buns and my father rhapsodised that they were the best thing he'd ever eaten. So, after they returned home to Washington, I sent him a box of Chelseas as a special treat; realising that they were perishable, I Federal Expressed them for immediate delivery. He thanked me, but not so subtly reminded me that he was still paying all my bills and that the delicious buns were costing him about five dollars a bite.

Ken Ludwig
(Trinity 1973)

Activism

✉ Your article about activism (CAM 91) missed the critical point that when democratic institutions are failing, activism

is often the only recourse for those affected. You could have mentioned, for example, the enormous democratic deficit in the UK. The current government obtained 56 per cent of the seats in the Commons with less than 44 per cent of the vote. Most likely there will not be another general election until May 2024. Constitutional checks and balances that exist in most other developed nations are already minimal and are under attack. Policy blunders in various fields affect people in a direct and personal way to a perhaps unprecedented degree. In these circumstances, how else, other than by activism, can injustices be remedied?

Frank Wilson
(St John's 1976)

The singularity

✉ I note that 2001's HAL is described as "Dry, genial, murderous". "Murderous" suggests desire to murder; my understanding of the premise is that undue emphasis was placed on the directive given to HAL to protect the mission at all costs. The logical consequence of this was the unfortunate deaths, effectively by neglect, of the other crew members. (OK, Frank was pushed!)

Incidentally, I liked the Agent Smiths from Corpus, Emma and Queens'!

Mike Whittaker
(St Catharine's 1976)

✉ Your excellent article on computers and intelligence (CAM 91) makes me want you to go further. What are they, in essence? I find the term artificial

intelligence too constricting: the tools and machines we make nowadays go beyond being just thinkers – they are a long way to becoming a new, inorganic form of life. Their intelligence, being human-derived, is arguably the least artificial thing about them.

Paul Lovatt Smith
(Robinson 1980)

Gates Cambridge

✉ I love the variety and breadth of CAM, and the fact that I hear about all sorts of things I would never otherwise read about. I enjoyed the piece on the Gates Cambridge Scholarship, which reminded me of my own experience getting a Leverhulme Trust grant for the first year of my PhD. My research was on the Vikings, but the candidates being interviewed before and after me were looking at the cheetah population in Zimbabwe and forestry in Nepal. The secretary told me they were willing to look at any proposal, but they did suspect that an applicant wanting to study surfing on Bondi beach perhaps had mixed motives! Keep up the good work.

Simon Coupland
(St John's 1978)

✉ I love reading your magazine as it reassures me that great minds are at work trying to solve the world's myriad problems.

I was interested to read about Jennifer Jia's work making sanitary pads from the remnants of fast fashion. However, what of plastic dust in the environment?

Much is trumpeted about recycling fabrics, because of course this is a good thing. However, man-made fibres such as polyester and nylon are another form of plastic and will not biodegrade. No-one seems to realise that if you recycle and reuse plastic you are perpetuating the ability of that plastic to fragment into dust particles every time it is used.

Plastic litter can be binned; but how do we get rid of plastic dust? According to Greenpeace, 85 per cent of the microfibres washed up around the world's shores are polyester. According



to the *New Scientist*, the two main sources of plastic dust in the environment are clothing and then tyres.

And it's not just at sea: the land is now covered in plastic dust, although, so far, it is not visible to the human eye. Scientists have shown recently that plants are now taking up plastic microparticles from the soil. We are sleepwalking towards an environmental problem that we will not be able to solve in future.

Caroline Ayers (née Cheshire)
(Trinity Hall 1981)

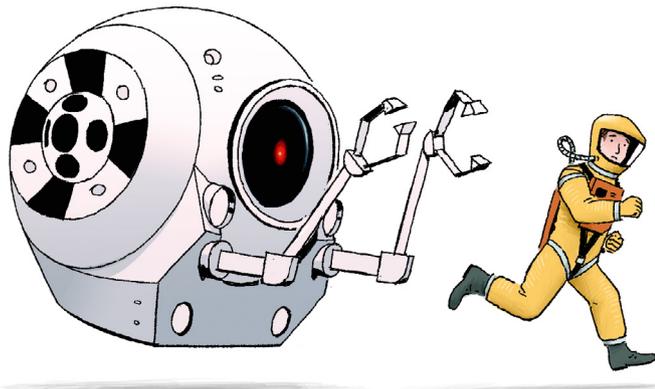
Reel to reel

✉ Your article on the Tape Recording Society rings a bell! I recall a chap in King's who had devised his own recording and amplifying system. This was of such force that he only got it up to half volume when he was required by the Proctors to remove his equipment, certainly beyond the Backs, and preferably out of the University altogether, because they feared he was going to hit the sound frequency of King's Chapel and blow out all the windows. I assume he went quietly!

Peter Benner
(Downing 1956)

✉ Despite the fame of the performers, when Yoko Ono and John Lennon appeared at Lady Mitchell Hall in 1969 (CAM 91) the audience was fairly sparse. As far as I remember, the act was highly experimental and improvised, owing its inspiration much more to Yoko than to John. Fortunately, the tape recording will be much more complete than my memory of something so long ago.

Anthony Matthew
(Trinity 1962)



In numbers

373,616

The number of SARS-CoV-2 viruses sequenced in the UK by the Cambridge-led Covid-19 Genomics UK Consortium

Number as of 24 March 2021

Campendium



Freedom of speech

University adopts a revised statement on freedom of speech

In September, the University adopted a new statement on freedom of speech. The statement, which was subjected to extensive academic debate and discussion, received a clear vote in favour from members of Regent House and is now part of University policy.

The statement confirms the University's duty to foster an environment in which ideas and opinions can be expressed without fear of intolerance or discrimination, while ensuring that in exercising the right to freedom of expression, staff, students and visitors remain tolerant of the differing opinions of others. It also formally states that invited speakers must not be prevented from

doing so, and adopts the 'Chicago Statement' on hosting events, which many universities, including Columbia and Princeton, have also put in place.

Vice-Chancellor Professor Stephen J Toope said: "Freedom of speech is a right that sits at the heart of the University. This statement is a robust defence of that right. The University will always be a place where anyone can express new ideas and controversial or unpopular opinions, and where those views can be challenged. The statement also makes it clear that it is unacceptable to censor, or disinvite, speakers whose views are lawful but may be seen as controversial."

Dasgupta Review

A new report on the economics of biodiversity could help set the agenda for the UK Government's 25-year environment plan. Produced by Professor Sir Partha Dasgupta, the report describes nature as "our most precious asset" and says it must not be ignored by economic decision-makers.

cam.ac.uk/dasguptareview



Deconstructed

Fish and trips: unseen writing explores friendship of Heaney and Hughes

Pembroke College has acquired the Barrie Cooke archive: a treasure trove of previously unseen poems, letters and papers written by Ted Hughes, Seamus Heaney and other writers.

Barrie Cooke, a leading expressionist artist, collaborated with Hughes on many projects, including suggesting and illustrating Hughes' poem *The Great Irish Pike* (1982).



He was part of a largely unknown friendship circle from which Hughes and Heaney drew career-defining inspiration and a shared passion for Ireland, water and fishing.

Highlights include 25 letters from Hughes written over 30 years, and an unpublished poem, *The Island*, in which Heaney wrote about Cooke's house on the River Nore in County Kilkenny.

Three-minute Tripos

THE HAPPY ENDING EFFECT RESULTS IN POOR FUTURE DECISION-MAKING. DISCUSS.

I love a happy ending! Everyone loves a happy ending. Don't they?
Hmmm. Just be careful you don't end up a victim of the Happy Ending Effect. **I decry your Happy Ending Effect, you nasty gloomster. Stop talking me down.**

This isn't me being pessimistic. Research has shown that when we make decisions based on past experiences, two different parts of our brain compete with each other.

The nice, sunny bit and the horrible, miserable bit?

No. The amygdala, which works out the object value of an experience, and the anterior insula, which marks down that valuation over time.

Oh. So it's a little bit more complicated than happy vs sad then?

Well, yes and no. The science is actually pretty simple. If you're deciding where to go for dinner, you think about where you've had a good meal in the past. But your memory of that meal isn't always reliable, because your brain values the final few moments of the experience more highly than the rest of it. We tend to make decisions based on previous experiences that ended well, irrespective of how good the experiences were overall.

I shall remember this next time I order takeaway.

Well, if you're really into happy endings, lead researcher Dr Martin Vestergaard points out that our attraction to the quality of the final moment of an experience is exploited by politicians seeking re-election, who will always try to appear strong and successful towards the end of their time in office. He says: "If you fall for this trick, and disregard historical incompetence and failure, then you might end up re-electing an unfit politician."

cam.ac.uk/happyendingeffect



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Clockwise from top (all Caius): **Precious Ndukuba** is a second-year architecture student; **Hannah Obie** is a second-year law student; and **Matthew Barker** is a second-year engineering student.

Loafing about

Cambridge University Bread Baking Society (CUBBS) rose from humble beginnings to become a source of comfort and community – both in person and online.

WORDS **DIANE SHIPLEY** ILLUSTRATION **KATE COPELAND**

Not many people would establish a society centred around baking when they can't access an oven, but second-year engineering student Matthew Barker (Caius) didn't let that hold him back.

"We had to do a presentation on a technical topic, and I didn't think I could do anything too complicated, so I talked about bread and pitched a made-up society called the Cambridge Bread Baking Society," he says.

His fellow freshers expressed such enthusiasm that the next time he made a loaf, he posted a message on the College year group chat asking if anyone wanted to come over.

"Fifteen people poured in, some of whom I'd never met before. It was incredible." It was also a vast improvement on his first attempt at baking without an oven.



"I tried doing it in a saucepan on the hob and ended up starting a chip pan fire, so we all had to run outside at 11pm. The next morning, I bought a Pyrex container, put the dough in the microwave and set it to a convection setting. That worked really well."

It soon became a weekly tradition, with Matthew dishing out three loaves over the course of an evening. "I'd bring one out and, 10 minutes later, it would be gone." His signature bake is sourdough because it's easy to make and has a distinctive taste. "It has a really thick crust and a flavourful texture which means it's delicious on its own."

Along with Secretary Hannah Obie and Treasurer Evan Thomas, he made CUBBS



an official society at the end of the Lent term. But while the chances to break bread in person may have been limited over the course of the past year, they've managed to keep in touch via a busy Facebook group, where members swap recipes and share photos of their own creations – from Irish sourdough and Greek Easter bread to a loaf in the shape of a frog!

Matthew now shares a house with an oven, which has allowed him to branch out into muffins and croissants, as well as a pizza-making night with his housemates. But bread is still his favourite. "There's a reason it's been with us for thousands and thousands of years. You only need flour, water and salt, but it's amazing what they turn into."

Most of all, he loves how it brings people together. "University can be stressful but very few students don't like bread. It really connects people from different subjects and different backgrounds. To me that's the best thing."



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This year, while the Alumni Travel Programme was on hold, the University has launched the Trip Scholar digital event series, a unique opportunity to travel the world – virtually, of course – in the good company of academic experts. So far, alumni have journeyed to South America, Iceland and the Balkans.

There's also our new webinar series, Cambridge Conversations, giving you access to leading thinkers and research with real-time Q&As and catch-up via YouTube. The series so far has taken in the impact of lockdown on the brain, discussion on why our universe consists of matter and the revolution taking place in cancer detection.

Finally, our e-newsletter contains details of all the latest alumni news and benefits, and is sent to nearly 200,000 alumni every month. Are you one of them? If not, please send an email to enews@alumni.cam.ac.uk with your alumni number in the subject line (your alumni number is printed on the address sheet that comes with CAM and on the back of your CAMCard). Please note that emailing enews@alumni.cam.ac.uk will not update your email address or postal details. To make these changes, please visit: alumni.cam.ac.uk/update.

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ILLUSTRATION: MICHAEL KIRKHAM



Philanthropy

Department of Chemistry named after alumnus

The Department of Chemistry is to be named the Yusuf Hamied Department of Chemistry, following a transformational gift from alumnus Dr Yusuf Hamied.

The gift will endow a fund in perpetuity to attract and support the world's brightest academic talent in chemistry.

Dr Hamied's long and distinguished career in industry and philanthropy includes pioneering the supply of HIV/AIDS medicines to developing countries at a low cost, saving countless lives. He has retained close links with Cambridge over the past 66 years, both as a supporter of his College – Christ's – and the Department of Chemistry.

"Cambridge gave me the foundation of an education in chemistry, taught me how to live and showed me how to contribute to society," said Dr Hamied. "As a scholarship student myself, I am delighted to be able to support future generations of students. I will always be indebted to this great institution and everything it stands for."

Dr James Keeler, Head of Department, said: "We are extremely thankful to Dr Hamied for his visionary support for Chemistry at Cambridge which will allow us to respond flexibly to future opportunities. His gift will ensure we continue to attract outstanding scientists who will make the discoveries that help tackle some of the most pressing challenges in global society."

In brief

NEW YEAR HONOURS

Four researchers have been recognised in the 2021 New Year Honours: Professor Simon Baron-Cohen, Director of Cambridge's Autism Research Centre (knighthood); Professor Usha Goswami, Director for the Centre for Neuroscience in Education (CBE); Professor Val Gibson, Professor of High Energy Physics at the Cavendish Laboratory (OBE); and Dr Michael Weekes from the Cambridge Institute for Therapeutic Immunology and Infectious Disease (British Empire Medal).

BYRNE ELECTED AS PRESIDENT

Dorothy Byrne, currently Editor at Large at Channel 4, has been elected as the next President of Murray Edwards College. She will succeed Dame Barbara Stocking and will take up the role in September 2021.

NEW MASTER FOR CLARE

Loretta Minghella OBE (Clare 1981) will return to her undergraduate college as Master in October 2021, following the retirement of Tony Grabiner.

A lawyer by training, Minghella was Chief Executive of Christian Aid from 2000 to 2017. She is currently First Church Estates Commissioner, chairing the assets committee responsible for managing an £8bn investment portfolio.

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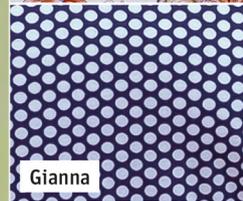
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Professor Daping Chu is Nanjing Chair of Technology and Innovation in the Department of Engineering.

Science fiction sets the bar high – but we're getting there

ILLUSTRATION KATE COPELAND

From Star Trek's holodeck to Iron Man's helmet, science fiction has set the bar high for real-time 3D holographic images. But while we are still pretty far from that, we are getting closer.

To appreciate the potential of 3D, think about how we get information about the world around us. The visual is very important: about 90 per cent of human input comes through our vision. But we don't just look at information. We also want to interact with our surroundings. Yet often this need for interaction is limiting.

Take computers. Before touchscreens, you needed to use a keyboard and a mouse, but to use a keyboard, you need training. Smartphones took off because of their touchscreens – a truly intuitive technology.

We interact with the real world in 3D, so why should we not be able to interact with a 3D holographic image in the same way? The goal is to produce a 3D holographic image that you can touch, hold and interact with. An image you can see in front of glass, rather than behind glass. One that would react to you and respond in real time. How much more would that augment your experience?

That's what we are working towards. One big problem is finding a way to make it more comfortable to view 3D images. Our eyes perceive depth images in two ways. They focus, using the eye muscle to see as clearly as possible, and they converge – they rotate towards each other. Focus and convergence happen at the same distance. But the current 3D display makes us focus on the screen while the 3D effect forces us to converge on the 3D object in a different place. Our brains can't cope with focusing and converging at different distances, which causes headaches and dizziness.

We need a holographic display to solve such a visual conflict for comfortable 3D viewing experience. But we don't yet have the computational power to provide the incredibly fast calculations required to generate large holograms. A high-definition TV, for example, needs three gigabits of computational power per second. For 3D images, we need around three terabits per

second – or, to put it another way, 3,072 gigabits per second.

To overcome this challenge, we have created a method of 'slicing' images, which solves both these problems. When you watch a film, the pictures are moving but they are not continuous movement – they are frame by frame. Our technique works like that. We take a 3D object, slice it into layers, and stack the layers together. This method reduces the data amount needed by a hundredfold. The images we create can be viewed from any angle, in space, with depth. You don't see the layers. It's an illusion, just like a film: you see it as a continuous image. And it can be manipulated in real time, using a mouse. We don't have a better way right now, but we hope that will come.

The next issue – which we haven't yet solved – is to add the experience of touch to the holographic image. That will be a long journey but it will be a lot of fun.

So much for the holodeck. One day, we also hope to catch up with Iron Man and his helmet viewer, which gives the wearer constant real-time information about their surroundings. Google Glass tried it but that was doomed to failure, too: it projected an image through the sides of the glass which was then presented in front of you. You had to focus on the image to see it clearly, then relax and return to normal. The disruption clearly wasn't practical.

We have now created an augmented-reality, head-mounted display where the image is always clear, no matter how you are looking at it. Again, it uses a different approach to get round the problem of dizziness and disorientation. Our headset sends a single pixel beam to the eye and scans it to form an image on the retina. So you only have to focus on a single beam rather than an image itself.

But while it is wonderful to be inspired by science fiction, our work has many real-life applications: in medical imaging, operating theatres, construction, outdoor sport, training and data manipulation, to name a few. We may not be at the holodeck yet – but we are getting there.

After 750 years, is the mother of parliaments in need of reform?

A global pandemic. The potential break up of the Union. Extremism. Fake news. The UK faces numerous challenges, but is our democracy up to it? CAM asked four experts for their reforms.

WORDS LUCY JOLIN ILLUSTRATION MARK LONG



The modern British parliament is one of the oldest continuous representative assemblies in the world. But after more than 750 years of service, is it time to give up on a system that majors in tradition but struggles with cooperation, devolution and extremism? Can parliament respond to the needs of modern democracy? We asked four Cambridge experts to set out their approach to reform.

Abolish Standing Order Number 14

Professor Alison Young, Sir David Williams Professor of Public Law at the University of Cambridge, and a Fellow of Robinson College

One of the biggest problems is that all the rules about how parliament regulates itself are determined by... parliament. Members can decide to change how parliament operates without any other kind of check. But one of these rules is particularly problematic.

Standing Order Number 14 states that the government's

business has precedence at every sitting. In practice, it allows the government to decide what you debate, when you debate it, and how long you debate it for – with just a few exceptions. This gives a huge amount of power to the executive and makes it very difficult for the opposition to hold them to account.

In times of crisis, of course, you need a strong and decisive government, unencumbered by too much restraint and process.

And that's the argument in favour of Standing Order Number 14: think of the swift action of the



Coronavirus Act 2020. But the downside is something like the EU (Withdrawal Agreement) Act 2020 – hugely constitutionally important and incredibly complicated – and pushed through with just three days of debate in the House of Commons.

Most other systems make these decisions using a cross-party committee – assessing how important the legislation is, how problematic it might be, or how complex it is – while including a separate mechanism to trigger emergency legislation. This means you can take over the timetable

if the issue is urgent, but you can't if it's not.

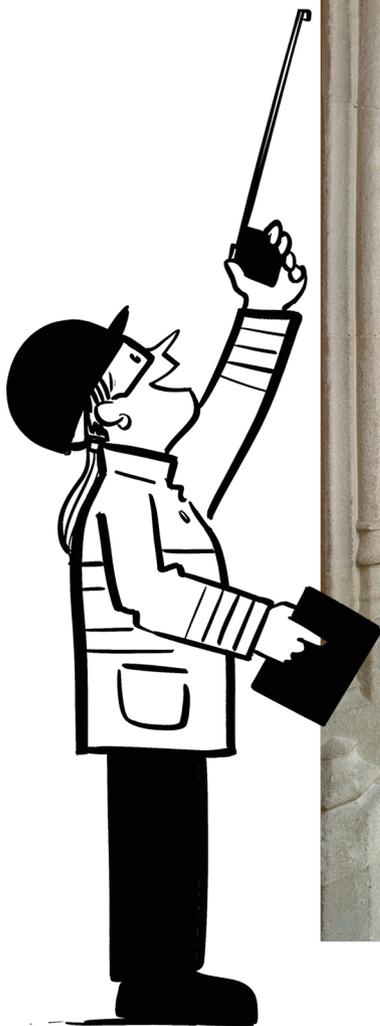
Standing Order Number 14 also has a more insidious effect: it forces parliament into being an arena, where MPs bring up issues to score political points and debate, while not effectively amending or scrutinising issues in detail, simply because they don't have time. In fact, a lot of the scrutiny takes place away from debate in the house, in corridors rather than on the floor of the House

There are two emerging voices within UK constitutionalism: Whitehall and Westminster.

Westminster sees the sovereignty of parliament as the sovereignty of government: it prioritises effective government, strong leadership and the ability to get things done as more important than democracy and accountability. Whitehall believes we have parliamentary sovereignty because it promotes democracy and elements of democratic decision-making that will create better decision-making choices. I'm with the latter: democratic decision-making is more important, and I believe Standing Order Number 14 makes it far harder. >



PHOTOGRAPHY: AARDVARK / ALAMY



Design a new building

**Professor David Feldman,
Emeritus Rouse Ball Professor
of English Law and Emeritus
Fellow of Downing College**

Picturesque as the Palace of Westminster is, its design is an obstacle to what most countries would regard as sensible consensus-seeking in politics. So, my proposal is a new building.

One of the big challenges for politics generally – and party politics in particular – is how to overcome entrenched tribalism and develop a willingness to listen.

The current chamber design is only suitable for two-party politics, where the two parties want to shout at each other. It is not a good design for multi-party

politics or consensus building. My building would have horseshoe chambers; committees already seat themselves in horseshoe formation. This would create a less confrontational space, allowing discussion.

Outside the chamber, MPs' offices are of variable quality, with insufficient provision for staff, and are distributed by parties' whips. Some members have no secure, indoor access to the chambers, and have to leave their offices, run downstairs and often across a busy road, risking life and limb in order to vote on a vitally important issue. This is one of many aspects of parliament that is uncondusive to good government. Many MPs lack working space in the Palace of Westminster, because there is simply not enough room for them.

Ideally, all offices, for members of both houses, should be in the same building, and provide sufficient space for members to work efficiently with their staff.

We also need a new breed of politician

Of course, a building alone will not improve the state of our politics, which, at the moment, is profoundly depressing. For that, we also need a new breed of politician. But should they arrive, we will need to give them facilities that will at least not discourage constructive discussion.



Change the electoral system used for the House of Commons

**Professor Michael Kenny,
Inaugural Director of the Bennett
Institute for Public Policy and
Fellow of Fitzwilliam College**

The conventional arguments for proportional representation (PR) are that it would mean more people are likely to feel that their vote counts, it would encourage MPs to work harder to address a wider range of opinion in the areas they represent, and it may enable a much clearer and quicker expression of growing public concern than the current system allows for.

But there is a different argument for PR, and this is a retrospective one. Had we had a more proportional system for electing MPs, it is quite possible that some of the dynamics that have resulted in such deep political divisions between different parts of the UK might have been mitigated.

First, the Scottish Conservative party and, since 2007, its Labour counterpart would not have collapsed so dramatically in terms of their representation within Westminster. Both would have continued to elect a few MPs, and their party leaderships would have remained more engaged with Scotland as a result.

Equally, the SNP's share of seats won would have been a bit smaller, which would have had a big impact on how the politics of Brexit would have played out at Westminster. And, had the Conservatives not lost so many MPs in different post-industrial areas across England since the mid-1990s, especially in the north, a very different kind of policy approach and programme might well have taken hold in the party after 2010.

The Tories might well have remained more connected to a broader range of opinion and interests across England. And, conversely, a Labour party that had kept more representation

in the southern parts of England, and not been so dependent on representation in large metropolitan cities, might have thought differently about its own policies. As a result, the geographical differences in the two main parties' representation in the Commons, which has been a notable feature of politics since the Millennium, might have been mitigated – to some extent at least.

There is now growing support for PR for a very different reason. In 2015, UKIP gained four million votes but won just one parliamentary seat – an outcome that left a significant body of political opinion unrepresented. It is interesting that this happened so close to the Brexit referendum of June 2016, no doubt compounding the feelings of many that their voices were not being heard in the political system, and that radical change was needed. It could be that support for PR will now grow across the left-right and pro- and anti-Brexit divides. ›



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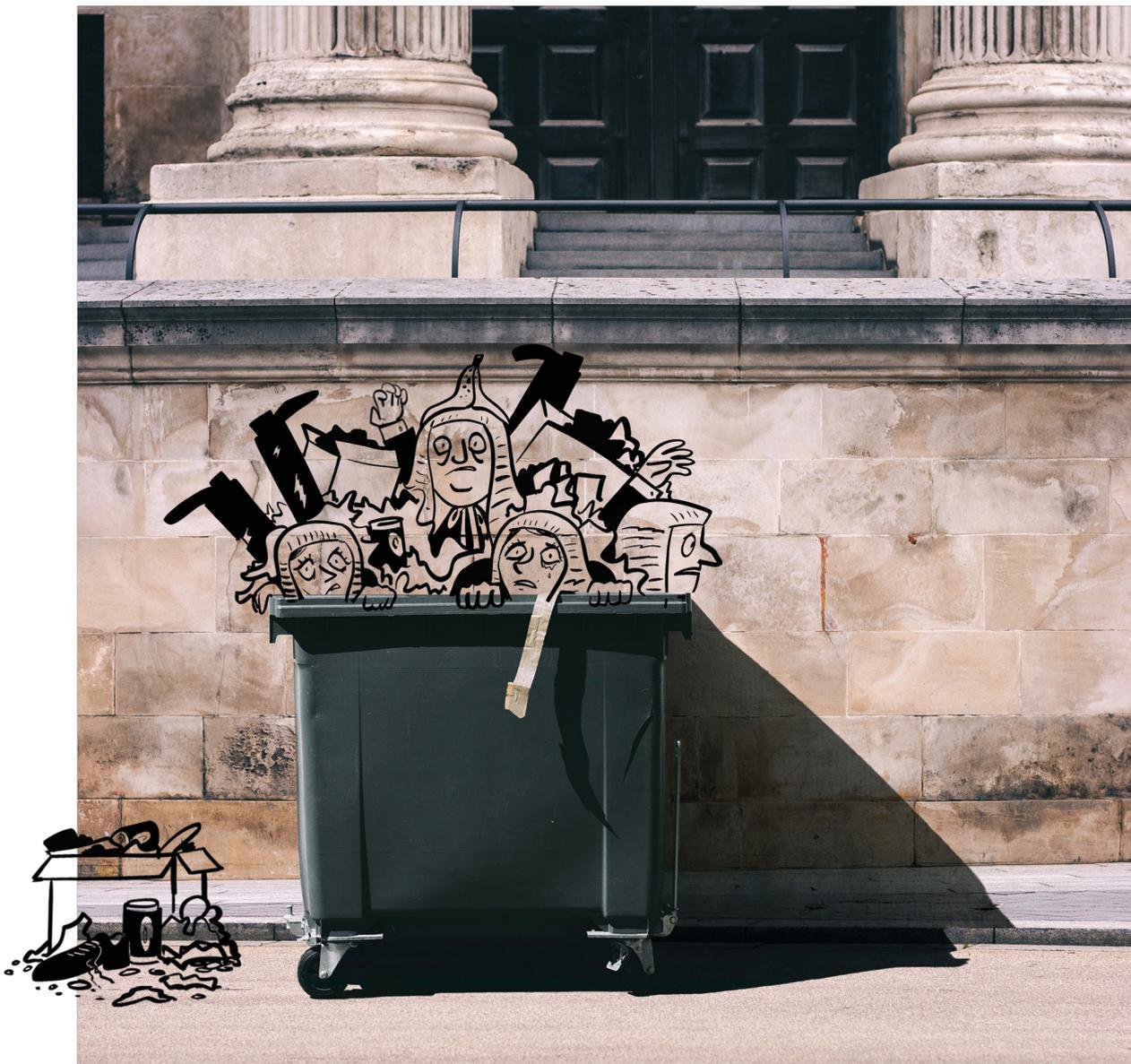
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Shake up the second chamber

**Professor Robert Tombs,
Professor Emeritus of French
History, Fellow of St John's College**

There's a famous Cambridge maxim that says: never do anything for the first time. And that's relevant when we talk about reforming the House of Lords, something that's been debated for at least the past 100 years.

If a second chamber has a role, then it is surely in some way to represent the country against the establishment. During the Brexit debates, it became obvious that the House of Lords has become the opposite of that: it was completely out of line with majority opinion, even more so than the House of Commons. There is something deeply wrong there. It's hard to see what justification anyone could come up with for doing it this way.

What might we replace it with? You can't just start again and design a perfect second chamber. At the moment, the House of Lords is too big, too old and too narrow. It's an agreeable drop-in centre for retired politicians and civil servants, but we should limit tenure for those sitting as legislators and separate the honours system from the legislative function.

Perhaps we should redesign the chamber to attract younger people who don't want to take over the House of Commons' powers. A bit like the American Senate, we would need a younger and more active house with clear responsibilities, including in foreign policy and in vetting appointments. Many people would like a house that represents the regions and the nations of the UK, or some of its major institutions. It would have to be kept out of the hands of the

established parties, so we would need to find a way of preventing constant deadlock with the House of Commons – which, of course, you often get in the USA.

Perhaps this is impossible and, instead, we should simply ask:

I'm tempted to just abolish it altogether

what is the purpose of having a second chamber at all? It doesn't represent the country against the establishment: it's the citadel of the establishment – or, at least, the previous generation of the establishment. If it wasn't there, what would we actually miss? What do the Lords do that could not be done by the courts, or some sort of judicial body? So, I'm tempted to just abolish it altogether. ☹

いよいよおちん



麻疹絵

Hashika-e (measles pictures)

Hashika-e were part of a general phenomenon during the 19th century of depicting the abstract causes of calamity and disease in concrete visual form. They feature mixtures of magical and talismanic text and visual symbols – attempts both to explain and to limit the severity of calamity and disease.

退治

Defeating the measles demon

This dynamic image captures the moment when the gigantic 'measles demon' is being brought down. Defying and defeating the demon are those townspeople whose occupation was most adversely affected by the disease. For example, sexual intercourse was discouraged, and a prostitute possibly employed in the pleasure quarters is joining in, brandishing her wooden pillow (on the upper right).



Living through, and with, a pandemic might be new to the denizens of the 21st century – but for people living in early-modern Japan, it was all too familiar. Now, a new transcription project – and a new generation of students – are bringing these specialist texts to a wider audience.

WORDS VICTORIA JAMES

Hashika (measles)

At the end of the Edo period, measles outbreaks typically occurred once every 20 to 30 years, usually coming into Japan from elsewhere.

The disease would race through the population with a very high infection rate among those born since the previous outbreak. The onset of measles was rapid, widespread and affected both children and young adults.

Left: *Defeating the Measles Demon*, Utagawa Yoshifuji, Edo (Tokyo), 1862. Colour print from woodblocks. Victoria and Albert Museum, London.

麻疹 Hidden deep among a swathe of early-modern Japanese texts, the details of how people dealt with the horror and trauma caused by pandemics in the past could shed light on the way we tackle similar challenges today. Yet these details are so well hidden that only a very few can decipher them.

Written in now-obsolete *kuzushiji* (a flowing cursive script-style) and using *hentaigana* letter-forms, the texts are inaccessible to all but a tiny minority outside of Japan. But now, thanks to a special summer school programme that harnesses cutting-edge artificial intelligence, their secrets have been unlocked.

The groundbreaking collaboration saw Dr Laura Moretti, who has run the Summer School in Japanese Early-Modern Palaeography for the past eight years, team up for the first time with Professor Hashimoto Yuta of the National Museum of Japanese History. Their project has produced a newly transcribed archive containing books and ephemera discussing a range of different epidemics (and what to do about them), and a new generation of scholars who have been trained to decode, read and analyse these materials.

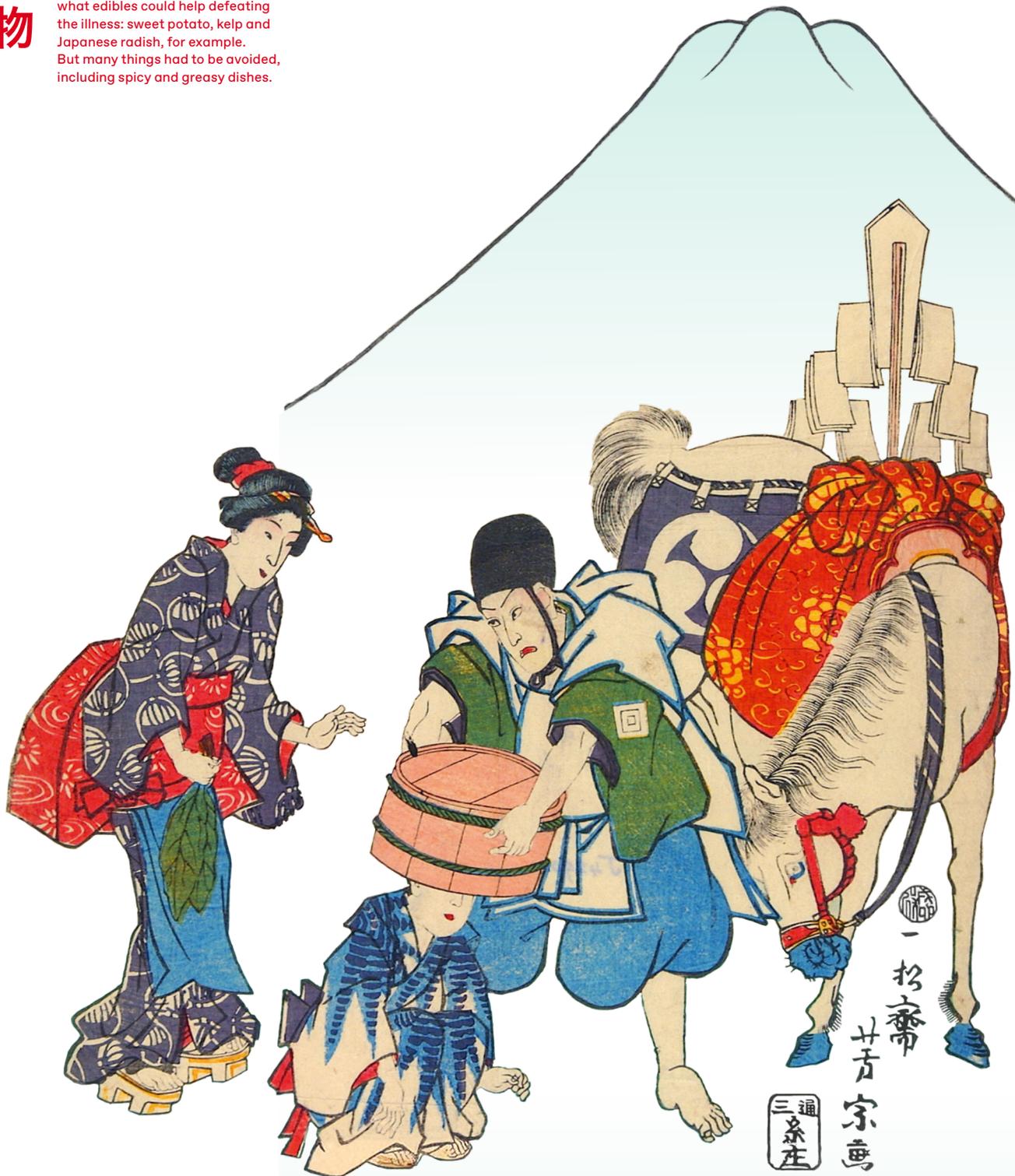
“Early-modern Japan had a booming commercial publishing industry,” says Moretti, Senior Lecturer in Pre-Modern Japanese Studies at the Faculty of Asian and Middle Eastern Studies. “But we decided not to work on the abundant medical treatises, which were written in *kanbun kundoku*” – that is, Chinese script with a Japanese reading. Instead, the focus was on *hentaigana* and *kuzushiji*, which even Japanese people can’t read without training.

That makes swathes of historical records inaccessible to all but the most dedicated scholar, be they Japanese or Western. And it’s why, in 2017, Hashimoto developed an AI platform named *Minna de Honkoku* (Transcription Together) that assists scholars reading Japan’s famously obscure early-modern writing. “Although these programs are relatively simple by the standards of AI technology, they greatly facilitate participants’ reading and writing of *kuzushiji*,” explains Hashimoto. And when Moretti decided to take her programme online in 2020, *Minna de Honkoku* seemed the obvious solution. >

食 べ 物

How to fight measles

Food was an important part of the fight against measles. Prints and books in the vernacular on the subject are very keen to list what edibles could help defeating the illness: sweet potato, kelp and Japanese radish, for example. But many things had to be avoided, including spicy and greasy dishes.



There's one heartbreaking description of thousands of bodies thrown into the bay at Shinagawa. I was reading this when news broke of my hometown struggling with so many bodies of Covid victims they had to call in the army. That resonated deeply with me

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Hashika (grain husks)

Food was not the only way to fight the disease. Early-modern materials teach us about other practices. For example, placing an empty horse-feeding bucket over the head was thought to be efficacious, because the bucket had once contained grain husks (in Japanese *hashika*, homonym for measles), but now the *hashika* is gone. The use of phonetic script for the word *hashika* would have allowed this play on words.

Left: How to Alleviate Measles, Utagawa Yoshimune, Edo (Tokyo), 1862. Colour print from woodblocks. Victoria and Albert Museum, London.

Moretti's chosen sources – some already digitised through such institutions as the National Diet Library and the National Institute of Japanese Literature, others newly captured in digital format – were digitised and added to *Minna de Honkoku*. The 20 or so texts represented a wide range of formats and subjects “to see how popular discourse around diseases was created”, says Moretti, with the common factor that almost none had previously been transcribed. Some of the volumes are informational, “such as popular guides to measles that detail symptoms and how to treat them”. Others are fictional, such as a charming picture-book showing toys rescuing children. “It’s even printed in red, an auspicious colour believed to help defeat smallpox,” she says.

Aside from the primary goals of transcribing hitherto inaccessible texts and advancing the palaeographic and digital skills of a cohort of scholars, the analysis generated insights into its all-too-timely subject matter – how societies respond to pandemics. “These books make us realise the tragedy of these diseases,” says Moretti, citing an account of a cholera pandemic. “There’s one heartbreaking description of thousands of bodies, so many no one knew what to do with them, which were thrown into the bay at Shinagawa. I was reading this when news broke of my hometown, Bergamo, struggling with so many bodies of Covid victims they had to call in the army. That resonated deeply with me.”

Other texts strike a more hopeful note. “Even the one about cholera ends with short stories giving people’s names and explaining how they managed to survive,” says Moretti. “Hope was strongly present.” As, too, was the perhaps more unexpected element of humour, which Hashimoto had encountered in comic responses to earthquakes in his previous work.

“Immediately after the Ansei Edo quake, which struck Edo (modern-day Tokyo) in 1855 and took the lives of more than 4,000 people, hundreds of types of prints began to appear. Most of the prints depicted giant catfish, a type of image known as *Namazu-e*, and were based on the myth that these giant catfish were living under the earth and causing earthquakes.”

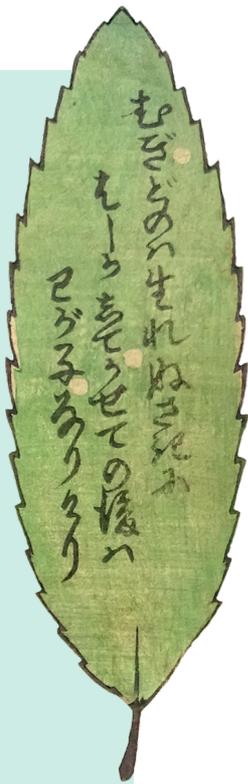
Noting that a Dutch anthropologist, Cornelis Ouwehand, has suggested that that one function of *Namazu-e* was to enrich the lives of the people affected by the disaster by providing them with ridiculous vulgar jokes and laughter, Hashimoto speculates that “perhaps the Japanese of the early-modern period were similarly trying to alleviate the intense stress and trauma brought about by plague, through humour and laughter”. ›

Human beings have lived through pandemics many times across history. These people went through exactly what we are going through now – and survived



呪い

Majinai (magical rites)
Magic, even verbal magic based on play on words, was believed to help fighting measles. Monkey dolls appear in some prints because saru (monkey) is a homonym of the verb saru (to leave). Deities also played an important role. The so-called Lord Wheat is depicted here as a mendicant monk of the Handa Inari Shrine, donned in red, a colour believed to protect from smallpox.



むぎどのは生まれぬさきにはしかして
かせての後はわが子なりけり

Lord Wheat got measles before being born. The pustules are now gone, and healed is my child

Magic was believed to help fighting measles. One of the most famous procedures was to write the afflicted person's name and age on the back of a tarayō (Ilex) leaf along with the short verse that appears on the leaf in this print. The leaf is then placed in a river or stream to be swept away by the current, hopefully, along with the disease. If you have no Ilex leaf at your disposal, we are advised to cut the paper leaf on the print and use it in place of a real leaf.

Left: A poem to defeat measles, Utagawa Yoshitora, Edo (Tokyo), 1862. Colour print from woodblocks. Private collection Suzuran bunko (Cambridge).

Another strand was the role of faith in supernatural forces. This especially piqued the interest of Anna Dulina, participating from Kyoto University where she is a PhD student studying medieval religions in Japan, who was intrigued “to compare religious thought of the medieval and early-modern period in the context of pandemics. For example, I was surprised to learn that people were permitted to freely collect stones from a shrine’s grounds to use as amulets to protect children from smallpox, even though the sale of amulets was a way for shrines and temples to raise money.” Dulina believes the newly transcribed works will prove valuable “in various research fields, such as culture, literature, religion, history and art”.

Above all, what shone through for Moretti was the way the texts “make us grasp that what we have experienced now with Covid is not as unprecedented as the media keeps saying. Human beings have lived through pandemics many times across history. These people went through exactly what we are going through now – and survived.”

It is a message that is perhaps underscored by the mutually supportive and collaborative nature of the online school itself, with scholars participating across every timezone, from the west coast of America to Japan. James Morris, an Assistant Professor at Japan’s University of Tsukuba, was one of the scholars using artificial intelligence as an integral part of a transcription project for the first time.

“The user draws a box round a specific character with their mouse,” he explains, “and is presented with a number of suggestions as to what the character might be. The user can then confirm the correct one, potentially with the use of other tools, or with knowledge from the context of the passage. *Minna de Honkoku* requires human judgment on its suggestions.” The experience, he says, is “a wonderful lesson and model for those involved in the digital humanities – digital tools are not made to replace humans, but to aid us. The project was a fantastic example of how human and machine can work together.”

The range of formats provided variety not only in subject matter, but also in the all-important paleography. “It was very beneficial working with such a wide range of texts in various styles,” says participant Freddie Feilden, a first-year PhD student at Trinity College. “This meant familiarising myself with many different types of handwriting, which is an essential part of early-modern Japanese palaeography.”

In its reinvention and continuation, the 2020 project became a mirror of the time and the texts it has unlocked – a place of resilience, adaptation and mutual support. “It kept us together and connected despite each of us at various points going through lockdown in their own country,” recalls Moretti. “It really was a saving grace in a difficult time.” ☺

Dr Laura Moretti is author of *Pleasure in Profit: Popular Prose in Seventeenth-Century Japan*. For more on the project, visit wakancambridge.com and cambridge.honkoku.org

B E C O M I -



In a time when Islam is increasingly portrayed as incompatible with western values, it is striking that more and more Europeans are becoming Muslim, says Professor Esra Özyürek.

WORDS PROFESSOR ESRA ÖZYÜREK PHOTOGRAPHY LIA DARJES

M -

— N G



— U S L I M

As a Turkish woman, I have seen first-hand the dynamism and tension that occurs in a country where different religions and empires come together. Asia and Europe, Christianity and Islam, religion and secularism: all these tensions shape daily life, politics and discussion in Turkey. Perhaps that is why I have always been fascinated by converts: those who embrace different ideas and different beliefs from those practised by their parents and grandparents and make those beliefs their own.

My research, focused on Germany, examines why Germans convert to Islam and, more recently, how Muslims, immigrants from Turkey and Syria, become German. And I've found that – unlike the news reports – the picture is complex, drawing together identity, faith, community and, perhaps most importantly, love.

There is no single kind of German who converts. They come from all backgrounds and levels of society: from East and West Germany, Catholics, Protestants and atheists. But their conversion paths are similar. Most people convert as a result of their personal links and friendships with Muslim people – in recent years, these links have become more widespread, but the path to becoming Muslim over the past 100 years has remained surprisingly consistent.

To these con —



—verts, Islam is the religion most compatible with the values of the traditional German Enlightenment. Back in the 1920s, some in Weimar Germany argued that the country needed spirituality rather than modernity to get out of its crisis

A hundred years ago, Muslims in Germany were from an elite class: doctors, engineers and traders from Turkey and India. Islam represented high culture. Mosques established by Indian Muslims became gathering places for educated, wealthy people to hear stories about the Orient. These Germans became the first converts, along with those who travelled to Muslim countries.

After the second world war, the face of Islamic Germany began to change. Workers from all over the world came to rebuild the country. Muslim workers, mostly from Turkey, began to connect with working-class Germans. Even though they mostly lived in workers' dormitories, humans always find ways to connect with each other. So, they met and married Germans, and some conversions happened that way.

The 1980s and beyond saw big changes in the working-class Turkish communities in Germany. Changes to employment law allowed them to bring in their families. Factories closed and unemployment rose. Germany opened its doors to refugees from many more Muslim countries. People with Muslim backgrounds now tended to live on the outskirts of cities, where they lived alongside not only other Muslims, but also poorer white Germans, eastern Europeans and immigrants from across the globe. People began to convert in these neighbourhoods, and the average age of conversion fell.

What is it like to convert? For some, Islam offers a structured life: it can help you start a family or a business, go back into education, or find a community. It frowns on drinking and gambling, and can be a way to establish a new path. Yet my research found that conversion comes with stigma. For some young German converts, that's part of the attraction: I have met converts who you might call teenage rebels. They want to feel like outsiders: they enjoy it when others are uncomfortable around them. But I have met many others who were taken aback at how differently they were treated after they converted, particularly women who chose to wear the headscarf. People talk to them slowly and loudly, assuming they could not understand German. Often, converts were considered insincere or manipulated by others – or they were accused of being potential terrorists.

Tension could also arise with other Muslims. While many (born) Muslims were happy to hear of people who had converted, not all were ready to welcome converts into their families or social lives. Indeed, during my research, converts often expressed disappointment at not being part of an idealised Muslim family. Many had small or broken families; they longed to be part of a big family with strong links. But their lived experience could be quite different: a German woman convert who married into a Turkish family reported how the family didn't necessarily warm to her – their attitude was "You might be a Muslim now, but you are still German." When their new family didn't embrace the convert in the way they imagined, it caused a lot of heartbreak. And when a man came into the family, there was often even more resistance.

I also found tension between Islam as it is practised by those with a Muslim background, and converts' ideas about how it should be practised. To many of the converts I spoke >





This exploration into how Germans become Muslim has also led me to my current work: the question of how Muslims become Germans. What does it take for people from Turkish or Syrian backgrounds to no longer be the *Aus*—

Konvertieren by Lia Darjes

In this series portraying Germans who have converted to Islam, Berlin-based photographer Lia Darjes asks the viewer to question their own perceptions of Islamic converts, challenging western stereotypes of Muslims.

to, Islam is the religion most compatible with the values of the traditional German Enlightenment. Back in the 1920s, some in Weimar Germany argued that the country needed spirituality rather than modernity to get out of its crisis. And some believe, today, that Islam is that answer. They see it as a purer religion: you are closer to God; there are no intermediaries; and they contrasted this with what they perceived to be the complex structure of other faiths such as Catholicism.

These converts argue that all the negative ideas that we have about Islam come from tradition and culture, rather than the religion itself. These traditions are not the 'real' Islam, and if you get rid of them, this structured religion is a great fit for German character. It was a surprise to me to hear, over and over again, that Islam is perfect – “it’s the people who participate in it that are bad”. I have been told that Islam would undoubtedly spread far and wide in Germany... if it wasn’t for Muslims. These people are not real Muslims, they say: they drink, they gamble, they should all go back to their own countries.

This jarred somewhat with my hope that conversions might lead to a more united, harmonious society! Yet if conversions are happening, then it follows that meaningful intimate connections between German Muslims and non-Muslims are also happening. I heard more than once how a convert was impressed by the commitment of a work colleague who would use their break for praying rather than smoking, and their sure feeling that there is a God.



—lander?

This exploration into how Germans become Muslim has led me to my current work: the question of how Muslims become Germans. What does it take for people from Turkish or Syrian backgrounds to no longer be the *Auslander* (outsider)? A big part of German identity after the war was based on the idea of the community taking responsibility for the Holocaust and establishing personal values based on that atonement. So how does this translate for Muslims seeking to be German?

In Germany, the Holocaust is often understood as a guilt that belongs to the older generations: “this is our guilt, not yours”. But after 2000, curriculums changed. There is a feeling today that Germans have atoned for, and overcome, their antisemitism. Instead, Muslims are the focus: they need to do penance – not white Germans.

Consequently, new Holocaust education programmes have focused on specific groups who are perceived to have their own sins. They use the German model of feeling guilty and responsible for what your ancestors have done, and taking on this responsibility. Arabs, for example, are encouraged to consider the Mufti of Jerusalem and his collaboration with Hitler. Intriguingly, this is a way to include immigrant Muslims into the Holocaust memory, citing antisemitic ancestors in their genealogy, creating a separate story.

But this still doesn’t mean Germans will take Muslims into their society and into their own narrative. Germany has spent 75 years coming to terms with the Holocaust, and this is admirable. The UK doesn’t do it with colonialism; the USA doesn’t do it with slavery. But we must be careful that it is not used to further marginalise some of the most marginalised groups in German society. A fight against racism shouldn’t just be stuck in the past: it should have a meaning for a fight against racism today, too.

What I would like people to take from my work is that all belief systems belong to all of us. And they should be available to all of us without judging and then without feeling that a belief system is our personal property. I want to get away from this group mentality. We are all humans. I don’t want to take a position on whether ideas came from God or from humans. But if there is a God, then it is for humans. It is for all of us. ☺

Esra Özyürek is Sultan Qaboos Professor of Abrahamic Faiths and Shared Values.

Public Service.

From rank incompetence to corrupt practices, procurement is under scrutiny in all walks of life. What needs to change if we are to get it right?

WORDS PETER TAYLOR-WHIFFEN

Think procurement is boring? Think again. In a world where the private sector delivers public services, procurement defines what government looks like at the sharp end – whether that is a disability benefits assessment or, notoriously, the effectiveness of track and trace. Indeed, when Marcus Rashford takes aim at the apparent quality of the free school meal ‘hampers’, ministers may respond, but the strike hits at the heart of government procurement.

No minister wants to explain why struggling families are getting substantially less food than a £30 hamper ought to provide. So how – and why – can it go so wrong? “Getting procurement right



The Good: London 2012 saw unprecedented success for Team GB in terms of medals (65 in all), but it was also a triumph in terms of its procurement strategy. The Olympic Delivery Authority created more than 8,000 subcontracting opportunities for the event’s construction project, delivering 50 inter-related venue and infrastructure projects on time and under budget. Key to the success was the use of a delivery partner – LOCOG – with experience in planning and implementing complex projects. As Jacques Rogge, then president of the International Olympic Committee, said: “London 2012 has already delivered on many of its promises and, by continuing to pursue others, we are optimistic that the people of London will benefit long into the future.”

London 2012 Olympic stadium

Queen Elizabeth
Olympic Park in
Stratford, London:
John Barani/Alamy

relies on those holding the public purse strings understanding where the process pitfalls are,” says procurement expert Peter Smith (St John’s 1976). As a former government procurement director, Smith should know, and recently addressed the subject in his latest book, colourfully titled *Bad Buying – How organisations waste billions through failures, frauds and f***-ups*.

“The first pitfall is technical incompetence,” he says. “If I buy a laptop, I can specify exactly what I want. When local or central government are buying more complex goods or services, they need to be equally as specific about their desired outcomes. A great example is the city council that procured a call centre service for public feedback – and agreed a contract so the company would be paid for each call they answered. There was no incentive for the provider to do anything other than answer the phone – all they needed to do was say to the caller ‘We need more information; can you get it and call us back?’ and they’d doubled their money without solving anything.”

But even if you can clearly define a procurement process’s desired outcome, that outcome can be difficult to quantify in a contract, he adds. “For instance, what you really want from procuring a prison contract, for example, is for prisoners to be safe, have no chance to escape, to be positively

Private

Good?

reformed and less likely to reoffend. But while those outcomes are very clear, how do you turn them into a contract? You can promise to provide a certain number of guards and a basic standard of comfort and food, but the resulting contract doesn't reflect the hoped-for outcomes."

Dr Amy Ludlow, whose research has examined how marketisation and privatisation can improve quality of life for prisoners and staff, believes we should be thinking more ambitiously and creatively about public procurement in the new post-Brexit era. "The UK's procurement rules have their origins within EU rules, so the starting point standards are non-discrimination and equal treatment, openness and transparency," says Ludlow, Bye-Fellow in Law at Fitzwilliam College and a Senior Research Associate at the Institute of Criminology. "But, beyond that, I'm particularly interested in how we evaluate quality from a social perspective and put that into the procurement processes. Public procurement can be an opportunity to go beyond minimum standards – for the state to lead proactively and spend taxpayers' money on things that we need in ways that also further social inclusion."

"There are real opportunities to embed ethical purchasing. It doesn't work in all contracts or settings – there obviously isn't much scope for creativity when you just need to get as much PPE into the country as quickly as possible – but there are opportunities to be bolder within procurement law to further social policy through procurement processes. The law is complex, and maintaining transparency and non-discrimination is vital. But there are more possibilities within the law than are often recognised."

The government is currently consulting on a green paper called Transforming Public Procurement – the main goal is to "speed up and simplify our procurement processes, place value for money at their heart, and unleash opportunities for small businesses, charities and social enterprises to innovate in public service delivery" – but Smith points out that flexibility and creativity also carry their own ›



**Berlin
Brandenburg
airport**

*Flughafen Berlin
Brandenburg BER:
Juergen Held / Alamy*

The Bad: The launch of a new airport in Berlin, planned to open in 2012, was supposed to reflect the growth of the city after the Wall coming down and its status as the capital of a reunified Germany. But it was beset by a series of crippling delays, accusations of corruption and a litany of failures and errors – including equipment and technology issues, poor workmanship, fired architects, construction flaws and poor cost estimation. The airport eventually opened its doors in 2020, billions of euros over budget, 14 years after construction started and 29 years after official planning was launched. According to Martin Delius, a former Berlin city politician who headed an extensive inquiry into what went wrong, those in charge decided "to give 30 to 40 contracts to smaller companies they thought they could pressurise into giving them lower prices. They built a very complex controlling system that didn't work."

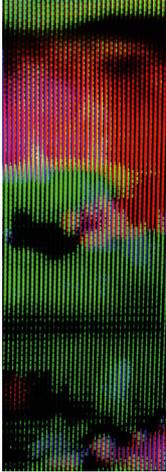
The company would be paid for each call they answered. There was no incentive for the provider to do anything other than answer the phone

risks. “We have to be careful, however,” says Smith, “because including social value considerations does open opportunities for corruption.

“One proposal in the green paper is that you can reserve lower value contracts for local businesses. However, there is a danger that when a contract comes up, the local council might claim that the company with the best capability happens to be the construction company owned by the council leader. And if anyone complains, the council leader can say, ‘Well, we’re just following the rules – it’s a local firm, and maybe it is more expensive than other companies, but they didn’t match my company’s [unquantifiable] social value’. So this focus on social value and localism could be very positive, but caution is needed.”

The green paper could bring other challenges, too. Under the old EU rules, buyers could not take past performance into account when awarding contracts – but proposals to change that could lead to contracts always going to the same providers. “The current rules mean you can’t show bias to a company that’s done your last five jobs brilliantly – even though you know they would offer excellent value for money,” says Smith. “Equally, you’re not allowed to automatically reject any company that consistently does a terrible job. I’m sympathetic to Green Paper moves to change that but it could compromise a fair bidding process and could lead to corruption.

Sociologist Dr Mihály Fazekas (PhD Sociology 2014) is pioneering the use of big data to measure and analyse governmental corruption across Europe. “Systemic corruption in the UK is very rare compared with many other countries, but the system is slowly deteriorating. The current government has declared a policy decision to govern free of bureaucratic controls as much as possible – while at the same time a lot of institutions that



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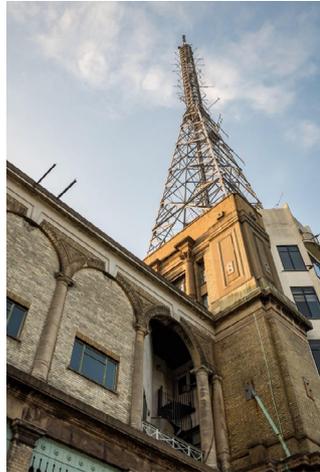
The Bad: In 2018 the Irish government bought a new €808,000 state-of-the-art Komori printer for use in its legislature building (Oireachtas), but when the machine arrived, officials found that it would not physically fit into the building where it was to be used. Contractually unable to return the printer, it was moved into external storage for 10 months while builders pulled down walls and added structural strengthening – adding a further €236,000 to the bill – so that the printer would fit into its new home. As David Cullinane, a Sinn Féin TD, said: “It is all too common for a lack of planning and foresight on behalf of government departments to result in additional costs for the taxpayer.”

The Good: As the last analogue terrestrial TV signal was switched off at a small transmitting station in County Antrim in October 2012, the largest broadcast engineering project in history was completed. Delivery was coordinated by Digital UK, a single-purpose organisation that worked with government, regulators, broadcasters and equipment manufacturers, among others. The result was 100 per cent adoption of digital TV, on time, under budget and with minimal consumer disruption. Despite the fact that it was described by industry expert David Elstein as “more complex, with more potential for chaos and consumer revolt than any other civilian project in our history”, the project was lauded by Ed Vaizey, then Minister for Culture, Communications and the Creative Industries, as an “unqualified success”.

BBC digital switchover

Digital TV broadcast glitch: Igor Stevanovic / Alamy

Alexandra Palace BBC television mast: pxl.store / Alamy



would constrain the government, such as the Audit Commission, have been weakened or removed.

“Bringing in more discretion can work very well – or it can further cronyism,” Fazekas points out. “We haven’t yet found the balance – which is why the media has picked up the rotten apples. And, of course, Covid is the perfect storm, because emergencies usually require a quick response and normal controls are relaxed. But one thing that can keep public procurement on the right track, and something we have seen in the UK, is the level of public interest in it and its transparency. That’s vital in holding governments to account.”

David Connell, Senior Research Associate at the Cambridge Judge Business School (CJBS), is the author of *Leveraging Procurement to Grow the Innovation Economy*, an independent review of policy commissioned by Theresa May when she

was prime minister, and published in 2017. “The US innovation economy is largely driven by federal agency procurement budgets, which they have deployed as informed customers to fund the development of the new technologies by US companies,” he says. “In contrast, the UK public sector generally operates by buying what is available ‘off the shelf’ at the time, and does not generally see it as its job to fund innovation by businesses.”

Connell is architect of the Small Business Research Initiative, established in 2009 to help government departments play this lead customer role better, and which now places R&D contracts with SMEs worth in total around £100m a year. His research at CJBS shows that lead customer innovation contracts like these have played a major role in the creation of some of the largest companies in the Cambridge cluster, speeding up time to market, reducing the need for venture capital, and thereby enabling founders to retain control and build a substantial business rather than having to sell out early.

“The second world war and the Covid crisis both demonstrated how much the nation’s innovators have to offer if government is allowed to enlist their support through procurement,” he says. “We have a huge amount to gain if this becomes normal practice, rather than just a mechanism to be used in time of crisis. It offers a win-win for both the public sector and our most innovative businesses.”

So what of the future? “The goalposts are definitely moving,” says Fazekas. “For decades procurement was about buying things as cheaply as possible. But now there’s strategic function. You can still be transparent, and you can achieve some goals, but there is a trade off. There are so many factors involved; it’s naive to think public procurement is a neutral value-for-money exercise. There’s more to it than that.”

Clearly, for the public to have faith in government money spent in their name, things have to change. Or as Marcus Rashford puts it: “We *must* do better. This is 2021.”



‘Fat Leonard’ scandal

US Navy’s Seventh Fleet flagship, USS Blue Ridge: Bryan van der Beek / Bloomberg / Getty Images

The Ugly: Described by the Washington Post as “perhaps the worst national-security breach of its kind to hit the Navy since the end of the cold war”, the case involved shipping support contractor Glenn Defense Marine Asia, a firm run by Leonard Glenn Francis, a Malaysian national known as ‘Fat Leonard’. Serving Navy officers were bribed to provide classified information in order to beat competitors and overcharge for services, leading to US federal prosecutors filing criminal charges against 33 people – including Francis himself, who pleaded guilty to being at the helm of a network that traded bribes of cash, luxury hotel suites, sex workers’ services, expensive cars, cigars and other gifts.

Светосред



My mind rebels at stagnation,” says Rebecca Fitzgerald’s literary hero, Sherlock Holmes, in *The Sign of Four*. “Give me problems, give me work, give me the most abstruse cryptogram, or the most intricate analysis, and I am in my own proper atmosphere.” Fitzgerald loves Holmes, she says, for the same reasons she loves her chosen field of early cancer detection. Both appreciate the human devastation that fiendish problems can leave in their wake, but both know the joy of tackling and solving those problems.

“As a junior doctor, I spent some time working with ovarian cancer patients,” she says. “We had a whole series of young women patients who died, and it made a big impact on me. When people were diagnosed too late, it just didn’t matter how good our medicines were.”

It was as a junior doctor, too, that she first heard about Barrett’s oesophagus, a pre-cancerous condition that can lead to oesophageal cancer (the sixth most common cause of cancer death in the UK). Not everyone with Barrett’s oesophagus goes on to develop cancer, but diagnosing the condition and monitoring its progress results in very early cancer diagnosis. This early diagnosis dramatically increases cancer survival rates.

Fitzgerald found this knowledge intriguing: that a pre-cancerous condition existed which could be diagnosed and monitored. But she also found it frustrating. “You knew someone was susceptible. Then you monitored the condition until it was inevitable that the person would get cancer. Then you would treat the cancer. It wasn’t very proactive. I thought that with some problem-solving we could do better.” ›

**“A bottle brush for the oesophagus”
– Professor Rebecca Fitzgerald’s
simple yet ingenious invention
is set to transform cancer care.**

WORDS LUCY JOLIN ILLUSTRATION JUSTIN METZ



Having trained at Cambridge as a gastroenterologist, she initially didn't think of herself as a researcher. But when her husband's career took them to Stanford, she found herself unable to practice – so she decided to pursue research. Looking to combine gastroenterology and cancer in a research project, she met George Triadafilopoulos, clinical professor of medicine at Stanford, who specialises in Barrett's oesophagus.

Barrett's oesophagus is a condition in which the normal cells that line the oesophagus (the gullet) are replaced with abnormal cells. The main risk factor for the condition is when low pH levels from the stomach move up into the oesophagus, causing chronic reflux. But there was little known about how the acids created by reflux could cause cancer. The pair discussed whether Fitzgerald might be interested in investigating this question.

Initially, Fitzgerald's research found the opposite result from what she was expecting. If she exposed cells to acid, they actually stopped dividing, which looked as if it would prevent rather than cause cancer.

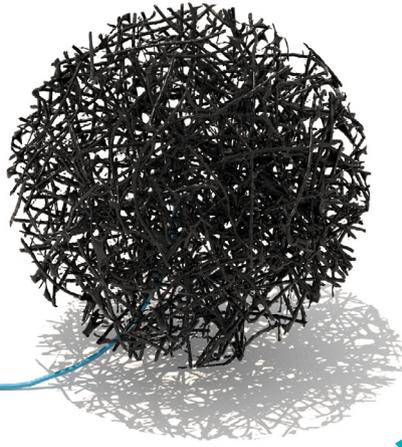
“So, then I had a bit of a eureka moment. I realised that the paradigm was wrong. We shouldn't be exposing the cells to

If people are diagnosed too late, it doesn't matter how good our medicines are

continuous acid: it should be pulsatile, in short bursts, to mimic the reflux. Once we did that, we found that the cells were indeed dividing abnormally. I get most excited about research when I can see the direct relationship to patient care, and this finding meant we could start thinking about the most effective drugs for acid reflux that would keep the acid down and suppress this pulsatile phenomenon.”

Keen to combine research with a range of patient care, she returned to the UK to complete her training at the Department of Adult and Paediatric Gastroenterology at St Barts and the Royal London School of Medicine and Dentistry, working with Professor Michael Farthing, then head of the Digestive Diseases Research Centre. It was a chance discussion with him that led her to the invention for which she is best known: the Cytosponge.

“We were discussing the challenge of collecting samples from patients. I wanted to do continuous monitoring of patients



It's a devastatingly simple idea: a pill on a string which expands into a small sponge

to try to find out what converted benign Barrett's to cancerous Barrett's. But monitoring, itself, was a challenge. Doing repeated endoscopies – where you are sedated and a camera on a flexible tube is passed down your throat – is invasive, involved and expensive. Michael said to me: 'What you really need is a bottle brush for the oesophagus.'

A pill on a string

Fitzgerald didn't forget that idea. It stayed with her over the next few busy years, as she completed her training and had her two eldest children. And when she took up a position at the Medical Research Council Cancer Unit in Cambridge, she decided the time had come to investigate it. What if she could create something to quickly identify patients with Barrett's oesophagus – something that could be more easily swallowed and removed to take frequent and accurate samples from the gullet? 'I'm inspired by practical things,' she says. 'My husband is an engineer. So, I talked to him and actually had the first Cytosponge prototype made in the engineering workshop.'

It wasn't perfect: the catheter was too rigid and the end was too sharp. But it was a start. Fitzgerald researched ideas from Japan and China, which both have high rates of oesophageal cancer, and found devices that involved balloons that the patient swallows deflated, and which are then inflated and wiggled around to collect cells before being withdrawn. Balloons didn't collect many cells, but the inflation/deflation mechanism was promising. Perhaps she needed a material that started off small and could expand? Something, perhaps, like a sponge?

Working with the Medical Research Council and a clinical devices company, she came up with the Cytosponge, which won her the prestigious Westminster Medal. It's a devastatingly simple idea: a pill on a string, that, when swallowed, expands into a small, rough-textured sponge. When the sponge is pulled back up, it collects cells from the gullet.

But solving the problem needed more than a device for collecting the cells: Fitzgerald and her team needed an accurate and fast diagnostic test. Her team identified a protein which was present in the abnormal cells, and an antibody that could be applied to the cells. This test, known as the Cytosponge-TFF3 test (after the antibody, named Trefoil Factor 3) stains cells brown, allowing them to be easily identified, a process that has now been made quicker using artificial intelligence.

Fitzgerald hoped her method of diagnosing Barrett's would be at least three times more efficient than the standard GP diagnostic route, which usually involved referring patients for an endoscopy and someone looking down a microscope at tiny biopsies taken

from this procedure – a process that was both labour-intensive and prone to error. The most recent Cancer Research UK-funded trial shows that the test is in fact 10 times more efficient. It doesn't just identify Barrett's: it is also better at picking up early-stage oesophageal cancer. And the procedure can be performed at a GP surgery by a trained nurse.

The extraordinary story of how Fitzgerald created the Cytosponge might seem to have a Conan Doyle-esque simplicity. A problem is identified, investigated and solved, using expertise and ingenuity. But developing a medical device is a far more complex narrative. That original proof of concept work that won Fitzgerald the Westminster Medal was back in 2004. Sixteen years later, the Cytosponge's rollout across the UK is only just starting.

'To get the data you need around safety, acceptability and efficiency for a device, you need big trials,' Fitzgerald points out. 'With a drug, you can often start off with quite small groups to get proof of concept. A device that is going to be used widely has to be acceptable to people who aren't used to frequent medical intervention. So acceptability is a major stumbling block in early cancer detection and prevention; this explains why it's been slow to progress compared with drug therapy.'

A new era in cancer detection

But the Cytosponge's success is helping that process to speed up: it's demonstrated just how important it is to encourage innovation in early cancer detection. The new Cambridge Cancer Research Hospital, for example, will house engineering and physics workshops, prototyping facilities and biology labs that will host experts from all over the world – a natural development from the engineering workshop where the Cytosponge was born. As the Cambridge lead for the International Alliance for Cancer Early Detection (ACED), Fitzgerald is already a champion of such collaborations, which have the potential to transform cancer detection worldwide.

'Someone said to me a year or two ago that it may not, ultimately, be my solution that makes a difference to the diagnostics, but that the idea takes us beyond endoscopy and into a new era,' says Fitzgerald. 'And that's what matters in the end. It's not about your own individual success. It's about contributing to the field in a way that has long-lasting effects.' ©

Rebecca Fitzgerald is Interim Director, MRC Cancer Unit, co-lead for the CRUK Cambridge Centre Early Detection Programme at the Hutchison-MRC Research Centre and Director of Medical Studies for Trinity College Cambridge. Visit philanthropy.cam.ac.uk/cancer for more.

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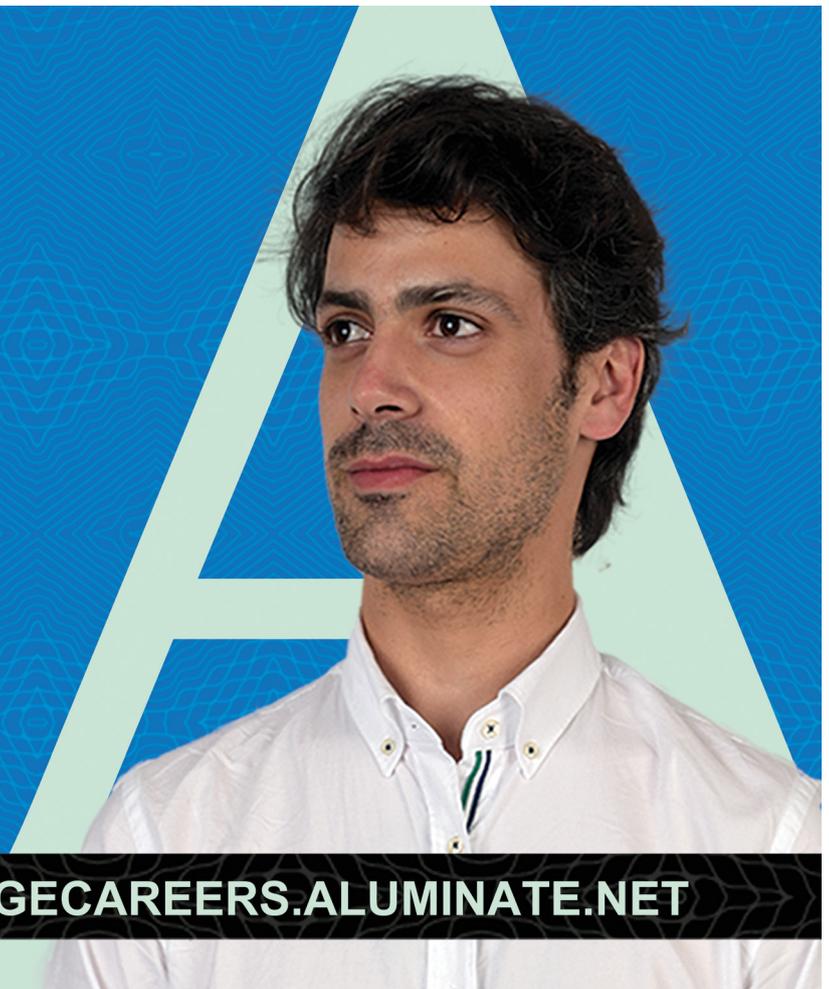


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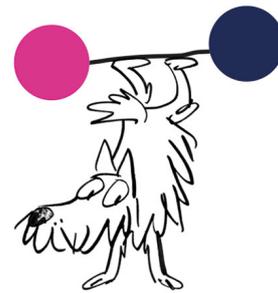
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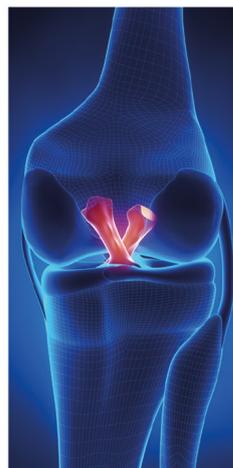
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The launch of the Cambridge Foundation Year will open up Cambridge to a new field of candidates and transform lives. Foundation Year Scholars will benefit from our personal approach to teaching and grow in confidence and understanding – and we will benefit from their talent and ideas. I cannot wait for them to begin.

Professor Stephen J Toope, Vice-Chancellor



What is the Cambridge Foundation Year?

The Foundation Year is a new scheme aimed at those who have the ability to study at Cambridge but who have been prevented from reaching their full potential. Scholars will have faced educational and social disadvantage, and are likely to include: care leavers; those who have missed significant learning due to health issues; students from low-income backgrounds and from schools who send few students to university; and students unable to access suitable qualifications. To apply, students must be ordinarily resident in the UK; the first students will start their studies in Michaelmas 2022.

Why now?

The need to build new pathways into higher education for those facing exceptional disadvantage has never been so pressing. The disruption of the past year has meant that students whose circumstances already presented huge challenges have been further disadvantaged by lack of time, technology and space to learn. Cambridge is committed to ensuring the most talented students, regardless of background, can attend – and scholarships are key to that vision.

Indeed, the Vice-Chancellor – who was a recipient of a Commonwealth Scholarship – has seen the impact of student support first-hand. “Without a scholarship, I would not have been able to come to Cambridge – I simply didn’t have the money,” he recalls. “The scholarship gave me the freedom to focus on my work and enjoy student life to the full. When I think about it, the entire trajectory of my life would have been different.”



We are hugely grateful that [their generosity] has provided the means for students to take up this opportunity, regardless of their financial situation

How will it work?

From 2022, the University will offer up to 50 places each year, with students joining one of 13 Colleges. After applying via UCAS, candidates will undergo interviews and assessments to identify their aptitude. A typical offer will be 120 UCAS Tariff points, equivalent to BBB at A-level – the standard Cambridge offer is at least A*AA. They will study a challenging and engaging multidisciplinary curriculum that will prepare them for undergraduate study in arts, humanities and social sciences subjects. If this pilot is successful, we hope to explore the inclusion of more subjects in the future.

On completion of the programme, students will receive a recognised CertHE qualification. It is expected that most will then progress to undergraduate study; the University will also fully support those who move on to study elsewhere.

How will the additional year be funded?

The Foundation Year will be free to all scholars: the launch of the programme has been funded by a cornerstone £5m gift from philanthropists Christina and Peter Dawson (St Catharine's 1974). Christina said: "The need for this Foundation Year has become ever clearer as the pandemic has exacerbated inequities and disadvantages. Peter and I are firmly committed to doing whatever we can to support Cambridge in addressing educational disadvantage in wider society, and are thrilled to have enabled the launch of such a groundbreaking and impactful programme."

To find out more about the Foundation Year, please visit: philanthropy.cam.ac.uk/foundation-year

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“Jessye Norman sounds like no one else on recordings – there are few voices as distinctive”

Jennifer Johnston (Caius 1995) can trace the start of her award-winning career back to a chance performance.

WORDS LUCY JOLIN



The Marriage of Figaro Mozart

In my first year at Caius, an ad went up for the University Opera Society’s semi-staged performance of Figaro, so I thought I’d have a go. When I turned up for the audition, I was given the role of Marcellina, which was ironic considering I was only 18 and she’s Figaro’s

mother. It began a career of playing much older women. Figaro was my first taste of opera; I was plunged into a musical universe I’d never encountered before – and I absolutely loved it. I’m still friends with others who were involved in it – like the brilliant baritone Leigh Melrose (St John’s 1991) and conductor Ed Gardner (King’s 1993), who is soon to take up the reins at the London Philharmonic Orchestra. It’s music that’s strongly tied to memories of my first footstep into opera, even though I’ve rarely sung it again and it’s not part of my repertoire – I’m a little too young, even now!

Figaro was my first taste of opera; I was plunged into a musical universe I’d never encountered before – and I absolutely loved it



Four Last Songs Richard Strauss

I was only a member of Caius choir for one year. At the end of it, we agreed that my voice was too big for the choir. Given that I now sing Wagner, that’s not surprising! During my first year this incredible invitation arrived: a ticket to watch Jessye Norman

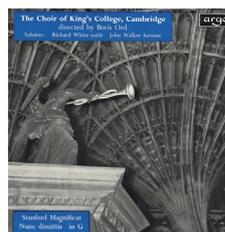
– one of my musical heroes – in recital at Jesus College Chapel. I was so lucky to be able to sit in this relatively small space and listen to this musical giant sing live, and her recording of Strauss’s *Four Last Songs* is one of my favourites. She sounds like no one else on recordings – there are few voices as distinctive. She had a most extraordinary sound – I always think of her voice as golden. And every time I hear it, I think back to that day: it’s a really clear and important memory of my time at Cambridge.



Christmas Oratorio JS Bach

After Figaro, I became Cambridge University Opera Society’s student leader, working alongside Sir Stephen Cleobury (St John’s 1967). It was the start of a friendship that lasted until his death. I was lucky enough to sing at his last concert at King’s – Verdi’s

Requiem – and his last Easter at King’s on BBC2. I had my first taste of professional-level choral singing under his baton, with a performance of JS Bach’s *Christmas Oratorio* in my first year, for which I was in the chorus, and singing in such a wonderful building made a huge impression on me. Stephen also gave me my first professional engagement as a singer – an opera gala in King’s Chapel – which marked the start of a long, fruitful relationship. When I left Cambridge, I became a barrister. After a few years in the law, I realised I wanted to change careers and sing professionally, and Stephen and Emma, his wife, were very supportive and helped me forge a career as a singer. He was very important in my professional trajectory, and it all started with that Christmas Oratorio.



Magnificat in G Charles Villiers Stanford

When I left Caius, I was given the music prize, which was ironic given that I left the choir after only a year. During that year, I had the opportunity to sing my favourite solo of choral music for a soprano – *Magnificat in G*. Certain pieces of music stay

with you even if you haven’t sung them for a long time; even today I can sing it from memory. It’s a piece that I associate with being part of the choir at Caius. Leaving the choir allowed me time to do other things, including lots of mooted and debating, which was useful in becoming a barrister. Even though I was only at Caius for three years, my memories of that first year in the choir are still very present. As alumni, the friendships, contacts and connections endure. That’s the lovely thing about Cambridge – you remain part of a community long after you graduate.

Operatic mezzo-soprano Jennifer Johnston (Caius 1995) is one of the UK’s most celebrated international opera singers.

This idea must die: We can't find new antimicrobials fast enough to make a difference

Dr Anna-Maria Pappa says her new technology will help win the battle against drug-resistant pathogens.

WORDS DR ANNA-MARIA PAPPA ILLUSTRATION GEORGE WYLESOL

In the battle against infections, we face an enemy that never sleeps. The bacteria, parasites, viruses and fungi that attack our bodies are constantly evolving, and our overuse of antibiotics in human and veterinary medicine means dangerous pathogens are becoming resistant to our drugs. Indeed, the World Health Organization warns that, without urgent action, we're heading for a post-antibiotic era – a time when common infectious diseases like pneumonia and tuberculosis will be impossible to treat.

But new drugs that can attack pathogens in totally new ways do exist – it's just that finding them is like looking for a needle in a haystack. That's where my research comes in: together with synthetic biologists at Cornell and materials scientists at Stanford, I'm working on speeding up the hunt for novel classes of antimicrobials with a new technology: a minute piece of cell membrane grown on the surface of an electronic chip.

Living cells are bags of genetic information and biochemical machinery surrounded by a membrane. Cell membranes are amazing structures and they're integral to cell homeostasis. Destroy the membrane of any cell – bacterial or mammalian – and it will die. That's why cell membranes are targets for so many antimicrobial drugs.

When we form a bacterial membrane on top of the electronic device it creates a barrier that affects the electronic signal. The device cannot operate normally with this barrier, so if we add a drug that destabilises

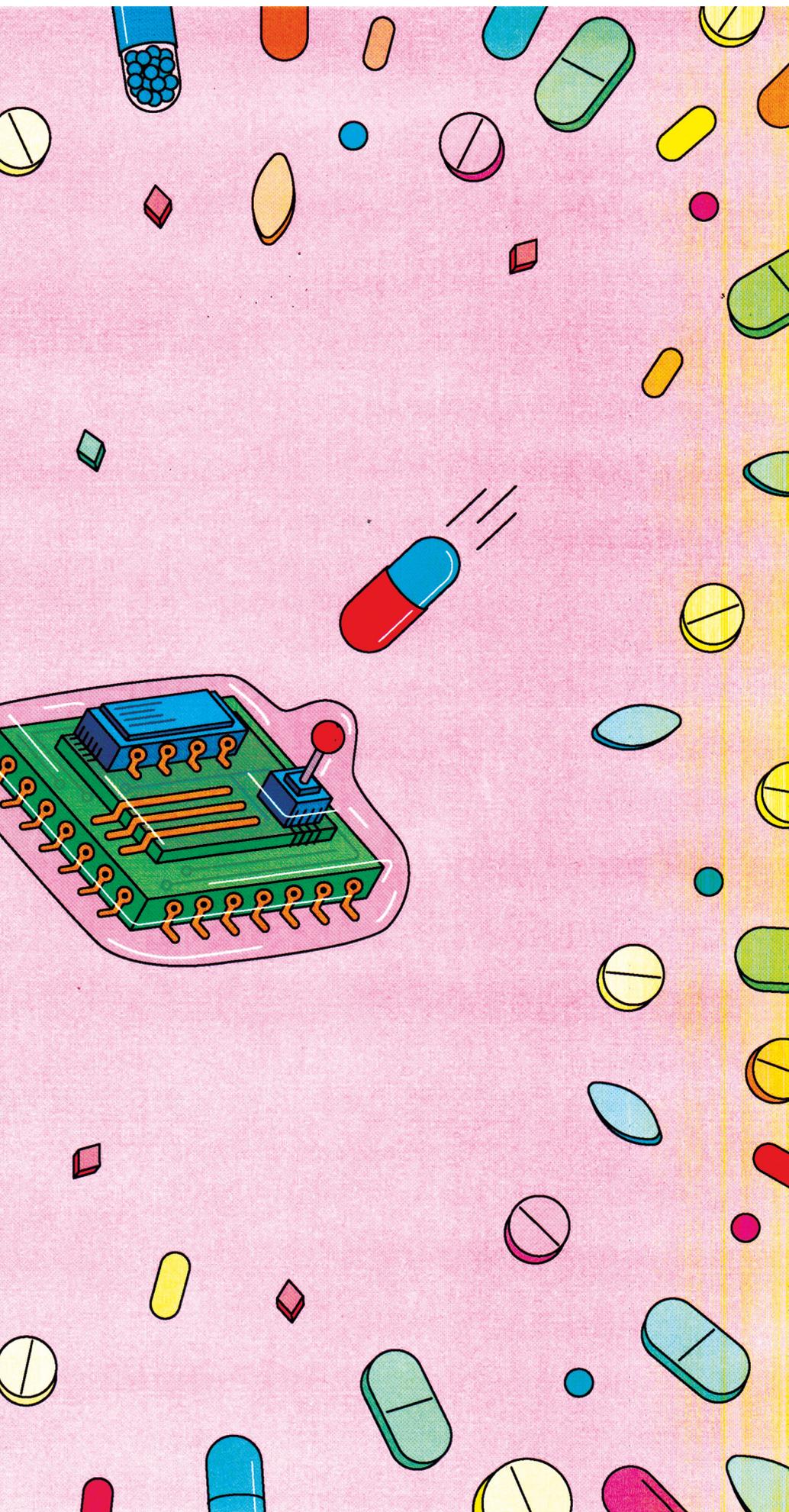
or destroys the membrane, it changes the signal. This gives us quantitative information on the destructiveness of different concentrations of a compound.

Compared with using whole-cell cultures for testing or screening drugs, our technology is more sensitive and reliable, as well as being more robust and scalable. Culturing cells for whole-cell assays isn't easy, and you need strictly controlled environmental conditions. Our device can be used anywhere and not just in a lab – even at the point of care. And our simple membrane-chip sandwich is so small that you can have multiple arrays capable of testing many drugs at the same time.

Our new technology has lots of exciting potential uses. We can use it to assess the potency of drugs that target cell membranes, and in drug discovery to screen thousands of compounds for drugs that work in novel ways. And because we can test mammalian cell membranes alongside microbial membranes, we can identify compounds that will kill microbes but are safe for humans.

One big challenge in the field of antimicrobial resistance is the lack of new drugs, but we hope our technology can massively accelerate the drug discovery pipeline. Part of the problem is that we lack strategies to assess the potency of millions of compounds; being able to develop hundreds of compounds is only part of the solution. You also need technologies that can identify them quickly. It's not that we lack





Our simple membrane-chip sandwich is so small, you can have multiple arrays capable of testing many drugs at the same time. It can be used anywhere, not just in a lab – even at the point of care

antimicrobials, it's just the process of finding them is really time consuming, but we hope we have a solution.

For example, there's a promising class of drug called antimicrobial peptides that work by destroying cell membranes, and which our collaborators are making in the lab. If you take two similar peptides with just one difference in their chemical backbone, only one of which is capable of killing bacteria, our technology is able to find it.

Beyond antimicrobial resistance, the technology can help us understand how cells interact with their environment. That's really useful in studying how viruses infect human cells, because it tells us which 'lock and key' a virus uses to enter – and replicate in – a host cell.

At the moment, we're working towards a prototype device that can be mass-produced. In future, we hope that the technology could also be used in precision medicine. For example, we could take bacteria from a patient with sepsis, turn that into a bespoke membrane-on-chip device, and use it to select the best drug to treat the patient, the drug that's most potent against their bacteria but least harmful to their own cells. So, far from running out of options to combat dangerous pathogens, we might just be tipping the scales back in our favour.

Dr Anna-Maria Pappa took up the Maudslay-Butler Research Fellowship at Pembroke College. She also holds an Oppenheimer Research Fellowship.



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What's My Line?

by Nimrod

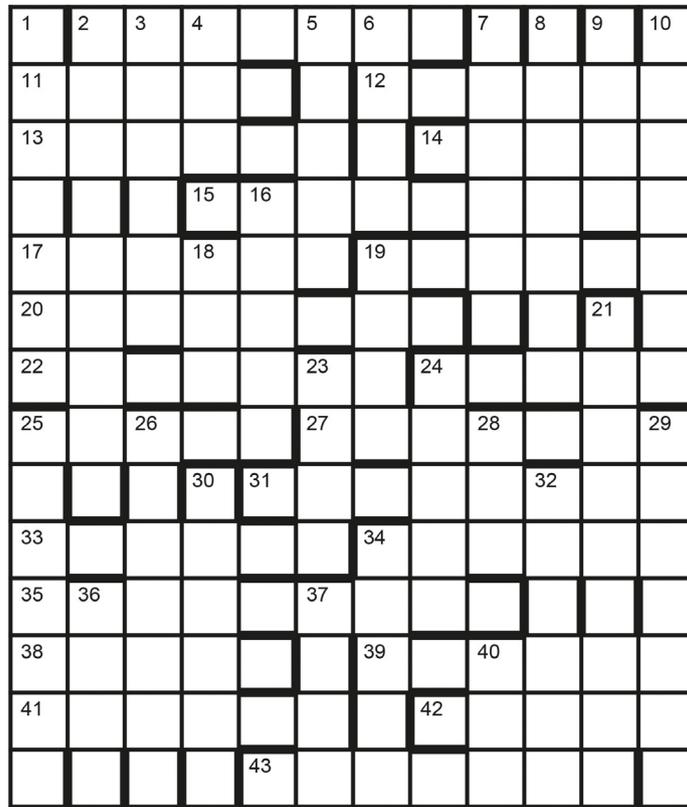
Nimrod has a new job. Wordplay in each clue indicates the occurrence of a superfluous letter. In clue order these letters spell two definitions from Chambers, each of which hints at a corresponding set of 34 cells to be highlighted in the completed grid. Solvers should deduce my (three-word) job and enter it under the grid. Optionally, the two sets of 34 cells may be highlighted in different colours.

Across

- 2 Ernie's partner's return with interest to supply new merger? (7)
- 11 Flower nectar finally presented to queen bees (5)
- 12 Rejected the raw deal involving pop-up producer (6)
- 13 Future of French state curbing winter's halting of growth (6)
- 14 The chief ingredient stuffed with very good fish (5)
- 15 Smartie pants secured item to assist the press (9, 2 words)
- 17 Planned something one might need to batter parts to eat (6)
- 19 Protection for military personnel, titan struggles to overcome (6, 2 words)
- 20 Dramatist's current book recalled Scot's own grandchildren (8)
- 22 It clocks how many spring games area's about to stage (7)
- 24 The backing of others carries no meaning (5)
- 25 Something of a wheeze, gathering in profits (5)
- 27 Town branch taking possession of mineral (7)
- 31 Learn about a rank Romeo's holding in a little bit of Shakespeare (8)
- 33 Left No1 subdued by mug's big stick (6)
- 34 Arsenic rating linked to mercury distillate (6)
- 35 Disorder of colour style embodied by surrealist's order (9)
- 38 Back in time, bar to worship (5)
- 39 Ships deserted ahead of characteristic narrow passage (6)
- 41 Send back turkey before tea, reportedly unfit for consumption (6)
- 42 Dispatched in the direction of fight (5)
- 43 Signal from ref: game on! (7)

Down

- 1 Business endlessly flashy DI's using as base (7)
- 2 I'll get along to bar after work sealing vessel (9)
- 3 Just when half of menu's cut, see the full picnic turning up (6, 2 words)
- 4 Peak's come and gone (3)
- 5 Used old tiller to move boat through rising river (5)
- 6 Father overwhelmed by his mum's City of Wine (4)
- 7 Lovers of poetry being put down by comic I saw (6)
- 8 Department's growth oddly ignored in river area (7)
- 9 Odd selection given a boost by Radio Shropshire (4, 2 words)
- 10 One observing sandpiper exhibit post-migratory behaviour? (7)
- 16 Time passed in cycling lodges when camping (5)
- 18 Midsummer Night's pieces (3)
- 19 Pacific staple cheers Australian native (4)
- 21 Old fuddy-duddy's wrong age for maintaining mass well (9)
- 23 Happen to rise above a poet's dark (4)
- 24 Period architectural feature's square (5)
- 25 Shade off blue in grid (7)
- 26 Character turns up in drive, poundless, to beg? Seriously (7)
- 28 More than one chap in jest takes excessive medication (3)
- 29 Try stirring up riot? I'll get what's coming to me (7)
- 30 Skin on large seabird (6)
- 32 Native American throwing stick at eg lynx by lake and away from land (6)
- 34 Icelandic chap thuggish, like hoods? (5)
- 36 Paradise south of a Red Sea port (4)
- 37 I will not set up amateur boatbuilder (4)
- 40 The most prominent of relics still rot (3)



My Line: _____

All entries to be received by 21 May 2021. Send your entry:

- **by post to:** CAM 92 Prize Crossword, University of Cambridge, 1 Quayside, Bridge Street, Cambridge CB5 8AB
- **online at:** magazine.alumni.cam.ac.uk/crossword
- **by email to:** cameditor@alumni.cam.ac.uk



The first correct entry drawn will receive a £75 CUP book token and a copy of *The Human Touch: Making Art, Leaving Traces* (Paul Holberton Publishing). The exhibition *The Human Touch: Making Art, Leaving Traces* will open on 18 May 2021 at the Fitzwilliam Museum. Two runners-up will receive a £50 CUP book token. Solutions and winners will be published in CAM 93 and online on 4 June at: magazine.alumni.cam.ac.uk/crossword

Solution to CAM 91 Crossword

Odd One Out by Nimrod

In the spring of 1819, John Keats (whose 225th anniversary occurred on 31 October 2020) wrote "Ode to A NIGHTINGALE", "Ode on INDOLENCE", "Ode to PSYCHE", "Ode on MELANCHOLY" and "Ode to A GRECIAN URN". In September, he penned "TO AUTUMN", the only one of the six odes not to contain the word ODE in its title.

U	R	N	A	N	I	G	H	T	I	N	G	A
N	E	O	N	U	R	S	E	E	D	O	I	L
A	N	K	E	R	I	T	E	L	E	O	N	E
I	N	N	E	R	S	O	L	E	A	S	T	I
C	E	O	M	A	H	A	S	V	P	E	R	N
E	T	C	H	I	T	U	P	I	K	S	A	D
R	A	K	E	R	A	S	R	S	A	D	D	O
G	R	M	A	P	U	T	O	E	G	O	A	L
A	S	A	R	I	E	U	S	D	E	N	N	E
Y	I	R	K	S	I	M	P	L	E	T	O	N
L	E	G	I	T	G	N	E	I	S	S	I	C
O	R	I	S	O	N	S	K	T	B	A	L	E
H	C	N	A	L	E	M	E	H	C	Y	S	P

Runners-up:

- Alan Saul (Churchill 1983)
- Peter Fitzgerald (Emmanuel 1960)

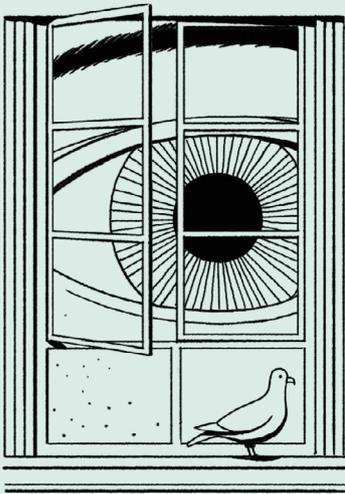
Clue notes can be found at: magazine.alumni.cam.ac.uk/crossword

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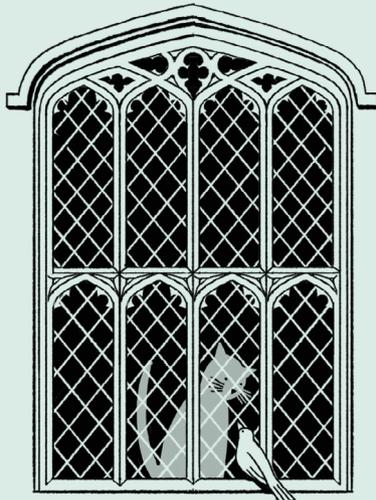
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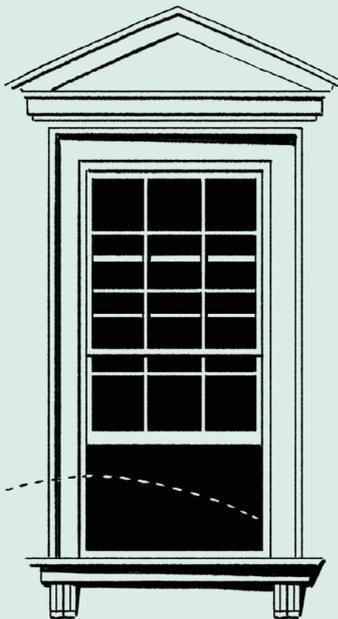
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Covid-19 latest

New research on 'long Covid'

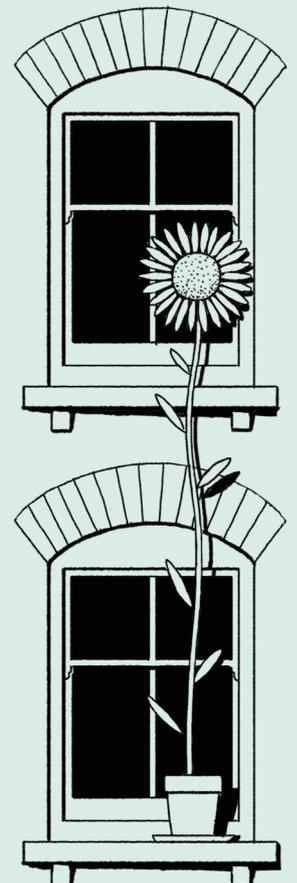
Latest evidence suggests that the likelihood of severe and 'long Covid' may be established immediately after infection, or at the latest, around the time that people begin to show symptoms. cam.ac.uk/longcovid

Latest Covid-19 research and analysis

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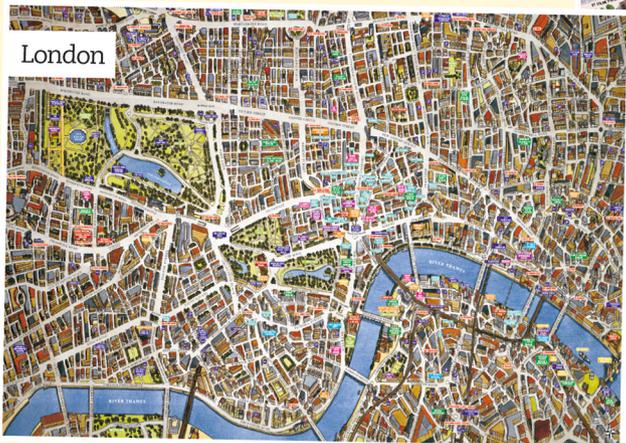
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