How Oxford became a home for enterprise and spin-outs

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The enterprise feature
Oxford has changed beyond all recognition in respect of its enterprise culture, re-drawing the familiar map of the city. Welcome to the brave new world of spin-outs and social impact ventures, not forgetting undergraduate and alumni contributions. Everyone, it seems, is getting their creative vibe on.

The precisionists are in town
On display until 22 July at the Ashmolean are these wonderful high modernist American artists. From Alfred Stieglitz to Ralston Crawford, Charles Demuth to Edward Weston, here they are now, many for the first time outside the US.

Beyond dieselgate
Alumnus Nick Molden explains how a commercial venture dedicated to consumer rights around car fuel economy morphed into the world’s greatest dataset of car emissions.

News
Oxford’s 100 year bond; the new Sports Centre at Iffley and the Chancellor’s Court of Benefactors.

Alumni
Reports from the Rome and San Francisco Meeting Minds Alumni Weekends.

AI ethics
Will the machines take over, and if so, what happens to ethics?

Oxplore
The new University app that is engaging school pupils up and down the land.

Dave Norwood
The man behind Oxford Sciences Innovation talks chess and venture capital at the University.

Varsity ice hockey
One to remember: dark blue victory in the icy coldness of St Moritz at a centenary match. Nothing short of historic.

Row the Atlantic
Just like that, apparently, schoolboy friends turned Oxford graduates just got on and did it.

Win the gin
Lots of new gins around but none have captured the taste buds of the experts quite like Oxford’s new Physic Gin.
From the editor

We are delighted to introduce a new annual magazine for alumni living in the US and UK who matriculated before 1976. The Oxford Today website is also being rebranded QUAD, along with our alumni monthly e-newsletter. We think the design is fresh and the articles reflective of developments at the University. All feedback to the editor is welcomed, by email at the editorial enquiry address given below.

This inaugural issue QUAD considers the future ethics of artificial intelligence by talking to Paula Boddington; we visit air quality expert and alumnus Nick Molden; and we look at the remarkable exploits of two recent alumni who rowed, seemingly effortlessly, across the Atlantic Ocean. While the spring weather may have arrived, the recent victory in the centenary Varsity ice hockey match by Oxford, played out in the historic surroundings of St Moritz in subzero temperatures, is still recent and well worth savouring.

Centrally in this issue, we consider the remarkable culture of enterprise and entrepreneurship at the University. The University contributes around £5.8 billion to the UK economy, and supports more than 50,000 full time jobs. Globally, the impact is £7.1 billion. The figures were calculated in a 2017 report by BiGGAR Economics, a leading UK independent economic consultancy.

Over a third of the contribution is from the core activities of teaching and research, as one might well expect. What is more surprising is the 13% derived from contract research, consultancy, executive education, facilities hire and knowledge transfer partnerships (KTPs). These are direct contributions to industry. A further 7% comes from the beautiful and brilliant books and journals that Oxford University Press sells globally, and a whopping 32% from Oxford’s Medical Sciences Division, just voted the world’s best for the 7th consecutive year (see facing page).

None of this squares with inherited and too often antiquated notions about what Oxford is, so we’ve dived in and made entrepreneurial Oxford the subject of a feature here (p.16), then paying a visit to distinguished alumnus Dave Norwood (p. 36), the founder of Oxford Sciences Innovation, the largest university venture fund in the world.

While we have only scratched the surface of an enormous subject, we have hopefully conveyed some of the atmosphere of excitement that is currently driving what Norwood and others judge to be a bona fide renaissance at Oxford.
University raises £750m in 100-year bond

The University has raised £750m in its first ever bond, as strong investor demand allowed the triple-A rated institution to borrow at historically low levels of interest. The University plans to use the net proceeds for long-term strategic projects and to further the academic mission of the university.

The 100-year bond was launched in November last year, and attracted close to £3bn in demand from potential investors. The interest rate payable on the bond is 2.5%, which is only marginally higher than the levels achieved by the government.

Oxford is not the first university to tap the bond market. Last year, Cardiff borrowed £300m in 40-year debt at just 3.1%, while Bristol borrowed £200m from a US investor in May this year.

‘Looking around the world we could see that other universities had entered the bond market,’ said Louise Richardson, Vice-Chancellor. ‘The time seemed opportune now, given the prevailing conditions and given the scale of our ambitions.’

Oxford's nineteenth-century diversity heritage celebrated with plaque

Christian Cole matriculated at Oxford in 1873 to read Classics, and graduated from Oxford in 1876. He became a member of University College in 1877 and became the first black African to practise law in English courts in 1883. A new plaque results from collaboration between the college and Pamela Roberts, Director of the project Black Oxford: Untold Stories.

Dr Rebecca Surender, Advocate and Pro-Vice-Chancellor for Equality and Diversity at Oxford, noted that the University has made it a priority to celebrate Oxford’s diversity. The plaque’s unveiling follows the launch of the Oxford Black Alumni Network, a campaign to connect Oxford's black graduates with future generations of black Oxonians in the UK.

Oxford to play key role in UK energy demand centre

March saw the UK Centre for Research on Energy Demand (UKCRED) announced by Claire Perry, Minister of State for Energy and Clean Growth.

Funded with £19.5m from the Engineering and Physical Sciences Research Council (EPSRC) and the Economic and Social Research Council (ESRC), it will be led by the RCUK Energy Demand Research Champion, Professor Nick Eyre, at Oxford, and bring together an exemplary, multi-disciplinary group of researchers.

Professor Eyre said: ‘The goals of a secure, affordable, low-carbon energy system are only achievable if energy demand is reduced, decarbonised and made more flexible. Understanding how these changes can happen is a major interdisciplinary research challenge.’

Oxford retains crown as world’s best for Medicine

In addition to being ranked top university in the world for the second year running in the Times Higher Education World University Rankings, Oxford was also ranked as the world’s best institution for medical and health teaching and research for the seventh consecutive year.

The University’s Medical Sciences Division is one of the largest biomedical research centres in Europe, carrying out a substantial number of clinical trials to develop new treatments and to improve patient care and safety. Oxford also came third in the world for life sciences.
Claire Tomalin awarded top Bodleian honour

At the Oxford Literary Festival in late March, Bodley Librarian Richard Ovenden spoke to biographer Claire Tomalin about her life. She was awarded the Bodley Medal, given to individuals who have made outstanding contributions to the worlds in which the Bodleian is active including literature, culture, science and communication.

The audience heard about Tomalin’s difficult wartime childhood, the break-up of her parents’ marriage, the death of her brilliant journalist husband, Nicholas Tomalin, on assignment, bringing up four children on her own, success as a literary editor and discovering her true vocation as a biographer.

Tomalin’s first book, The Life and Death of Mary Wollstonecraft, won the Whitbread First Book Award. She has gone on to write a number of highly acclaimed and bestselling biographies of Jane Austen, Samuel Pepys and Charles Dickens.
Household air pollution linked to disease risk

Researchers from the University of Oxford, Huazhong University of Science and Technology, the Chinese Academy of Medical Sciences, and Peking University in China have published research linking household air pollution with the risk of death from cardiovascular disease in a large study of 271,000 residents in five rural areas in China.

The Boat Race, lost

On an overcast day in London, Cambridge completed a clean sweep of all four races just three years after Oxford did the same, in 2015. But hours later Oxford won the centenary ice hockey match... (see p26).

Women of achievement

Dame Helena Morrissey, DBE, spoke in April at the Women of Achievement Lecture Series. Funded by the Vice-Chancellor’s Diversity Fund, and hosted by Vice-Chancellor Professor Louise Richardson, the series aims to raise the profile of women of high achievement and increase the range of role models accessible to women at Oxford, and challenge and inspire the entire Oxford community. Morrissey’s lecture was titled, ‘From Patriarchy to Partnership - a new opportunity to achieve gender equality.’

Dame Helena is well known in the City, particularly for her work on gender equality. She was CEO of Newton Investment Management for fifteen years and has recently joined Legal and General Investment Management. A philosophy graduate, Dame Helena is married to a Buddhist priest and they have nine children. Her first book, A Good Time to be a Girl, Don’t Lean In, Change the System, was published by William Collins in February 2018.

Oxford’s new Sports Centre at Iffley takes shape

The new Acer Nethercott Sports Centre (pictured above) will open this summer, a major milestone in the development of the wider Iffley Road site. Named after the late Olympic rower Acer Nethercott (University College, 1996), the new Sports Centre has cost £10.2m. It was preceded in 2003 by the Rosenblatt Swimming Pool (named after Lief Rosenblatt, Magdalen College, 1974). Future developments include ambitious plans for a new gym and well-being centre; a new grandstand incorporating a cricket school; a combined rugby and rowing training centre and further development of the Indoor Sports Centre. March saw the formal opening of the Gallie-Lewis-Dean Gym (known as the GLD). The gym is named after former Oxford University Amateur Boxing Club (OUABC) head coaches Alf Gallie, Percy Lewis and Henry Dean, who between them gave over 100 years of service to the club. The multipurpose activity room will be used by OUABC for training, as well as providing exercise classes every week for students, staff and members of the local community.
The following new members were admitted to the Chancellor’s Court of Benefactors at a special ceremony in Convocation House during Michaelmas Term. The Court, which now has more than 250 members, celebrates and recognises those friends and supporters who have been outstandingly generous towards the University and the colleges.

**New Individuals**
- Mr Ghazi Abu Nahl and Mrs Hind Ali Tabaja
- Mr Thomas A Barron
- Mr Henry Tin-Sang Chan and Mrs Joanna Sui-Ping Chan
- Mr Jarvis Doctorow (represented by his daughter Mrs Suzanne Larson)
- Mr Simon Li and Mrs June Li
- Mr Miles Morland
- Professor Joseph Sassoon
- Mr Peter Thompson
- Baron Lorne Thyssen-Bornemisza
- Mr John Wylie, AM
- and Mrs Myriam Boisbouvier-Wylie

**New Organisation Representatives**
- Mr Warren East, CBE, representing Rolls-Royce
- Mr James M. Jones, representing the ExxonMobil Foundation
- Professor James McEwen, representing the Dunhill Medical Trust
- Mrs Monique Villa, representing the Thomson Reuters Foundation
- Mr Wu Xu, representing Creat Group

**New Fellow of the Court**
- Mr Peter Shone, representing The H B Allen Charitable Trust

The CCB Fellowship was created to distinguish those members of the Court that have provided exceptional philanthropic benefactions. CCB Fellows are making a long-lasting difference to a multitude of academic priorities at Oxford.

### New heads of house

**Balliol College** has appointed Dame Helen Ghosh DCB, Director General of the National Trust, to succeed Professor Sir Drummond Bone as Master, and has already taken up her post (1 April).

**Mansfield College** has appointed Helen Mountfield QC, a specialist in human rights and education law, to succeed Baroness Helena Kennedy as Principal from 1 September.

**Harris Manchester** has appointed The Revd Professor Jane Shaw, Professor of Religious Studies and Dean for Religious Life, Stanford, to succeed Revd Dr Ralph Waller as Principal from 1 October.

**Wolfson College** has appointed Tim Hitchens CMG LVO, Director-General, Economic and Consular at the Foreign and Commonwealth Office, to succeed Professor Dame Hermione Lee.

**Oriel College** has appointed Neil Mendoza, Chair of the Landmark Trust, to succeed Moira Wallace OBE as Provost, following the death of Provost-elect Dr Mark Whittow.
Viewing American art from a global perspective

Although Oxford has long been a key centre for the study of US history, politics and culture outside North America, teaching and research in American art has not always kept pace. Thanks to the Terra Foundation for American Art’s generous support, however, the study of this important subject is now firmly embedded at the University.

In 2016, a gift from the Foundation created a Visiting Professorship in American Art, a post that has contributed significantly to cross-cultural discourse on the visual arts of the United States.

‘This is a very exciting time for American art at Oxford. The visiting professorship scheme is moving from strength to strength, and the enormously successful Ashmolean Exhibition, ‘America’s Cool Modernism’, of which the Terra Foundation is a key partner, is shining a spotlight on artists rarely encountered in the UK,’ says Professor Geraldine Johnson, Head of the Department of History of Art.

The inaugural professorship was held by Professor David Lubin in 2016 -17, with Professor Miguel de Baca currently in post. Dr John Blakinger will be the third Terra Foundation Visiting Professor in 2018 -19. See p.20, ‘America at the Ashmolean’

Researching the economic lives of refugees

Major new research on the economic lives and contributions of refugees in Uganda, Kenya and Ethiopia is being conducted at Oxford’s Refugee Studies Centre (RSC), thanks to support from the IKEA Foundation. The insights that emerge from this research will be used to inform humanitarian policy and practice to benefit refugees in the long term.

According to Professor Alexander Betts of the RSC, the Foundation’s gift of £1.3m is enabling the Centre to ‘scale-up its work on the impact of refugees while building capacity for research, teaching and impact’.

The gift will also fund a three-year research fellowship at Lady Margaret Hall, as well as bursaries for the RSC International Summer School in Forced Migration.

Driving new drug treatments

Worldwide, there is a pressing need for new, cost-effective medicines to treat or prevent chronic illnesses. But finding successful ways to translate novel therapies from bench to bedside is far from straightforward, and many challenges must first be overcome.

To help address these issues, Oxford has announced the creation of a new Chair of Clinical Therapeutics – a vital research post that will help to re-establish the role of the UK as a world leader in clinical pharmacology. Once appointed, the Chair will work to develop close partnerships within Oxford, and more widely with the pharmaceutical, biotechnology and diagnostics industries, in order to drive new drug treatments through early phase clinical trials.

The new Chair has been made possible thanks to generous philanthropic support from Professor John Climax, whose gift will also be used to endow a new fellowship scheme in Clinical Therapeutics. Both the Chair and Fellowships will be associated with St Hilda’s College.

PHOTO: N OMATA
PHOTO: C/O ASHMOLEAN MUSEUM
PHOTO: JOHN CAIRNS
What do the Apostolic Palace, VR headsets, the Mayor of Los Angeles and circadian rhythms have in common? They were all featured at the Meeting Minds Alumni Weekends in Rome and San Francisco in spring 2018. Almost 1000 alumni and guests came together for a feast of intellectual and culinary delights, reconnecting with old friends and discovering new ones in the Eternal City and the City by the Bay.

In Rome, the academic programme featured cutting-edge medical research from Professor Jim Hall and Stephen Taylor, who not only gave a talk about their work on the use of virtual reality to better understand DNA, but also spent the afternoon providing demonstrations of the technology to alumni. One of the alumni attendees, Mary Jose (St Hugh’s, 1957) said: ‘I really appreciated being taken to an actual frontier of scientific research in a way that was truly comprehensible.’

Ancient Roman music as interpreted by Professor Armand D’Angour, and the history of Pompeii, by Dr Paul Roberts, also enthralled the audience with many alumni praising the enthusiasm of the speakers who brought history to life. Fiona Herron (Pembroke, 1987) said: ‘Dr Roberts was so enthusiastic and did a great job of ‘selling’ the exhibition [the upcoming Ashmolean exhibition on Pompeii in 2019] - I’m only sorry it’s such a long wait.’

The weather was onside as the clouds parted in order for alumni to enjoy the magnificent views over Rome from the Villa Miani during the Saturday night gala dinner. Professor Louise Richardson FRSE, Vice-Chancellor of the University, wished everyone a ‘Lá fhéile Pádraig sona dhuit!’ (Happy St Patrick’s Day) and emphasised how important alumni are to Oxford. Alumni were privileged to be given access not only to the British Ambassador’s residence for the traditional Sunday brunch but also to private areas of the Vatican not usually seen by members of the general public, plus an exclusive tour led by an expert in the history of medieval art, Professor Alessandro Conforti, from the Vatican Museum.

Across the pond and two weeks later in San Francisco, alumni and their guests attended presentations on subjects as diverse as ‘Truth and trust in the era of social media’, ‘Sleep and circadian rhythms’, and Changing perceptions of medical ultrasound’, while attendees were treated to one-on-one discussions between the Chancellor and Sir Michael Moritz (Christ Church, 1973), and between Reid Hoffman (Co-Founder of LinkedIn and Honorary Fellow at Wolfson), and the Mayor of Los Angeles, Eric Garcetti (Queen’s, 1993).

The Bodleian Library brought over highlights from their upcoming exhibition ‘Tolkien: Maker of Middle Earth’ including beautiful watercolours painted by Tolkien, the original dust jacket design for The Hobbit (1937), as well as a recently-discovered printed map of Middle-Earth, annotated by the author and his illustrator Pauline Baynes. Thirty-five Oxford colleges hosted special events around the weekend for alumni to reconnect with peers and old friends, and there were many other events hosted by
the Rhodes Trust, the Oxford Foundry, the Law Faculty, University Sport, Physics and Maths, and Said Business School. Sunday morning dawned with a fun run for alumni and friends, and a session for interested students and their parents hosted by Undergraduate and Graduate Admissions. Alumni also enjoyed a gala dinner at the Ferry Building, punctuated by a beautiful choral performance by the Queen's College choir, who are currently on tour in America. Enthusiasm remained very high in spite of a deluge of rain in a city known for its temperamental weather. The last word should be given to an alumnus: 'My wife and I, newlyweds when I was up at Oxford in the early 1970s, very much enjoyed attending the recent gathering in San Francisco. It gave us a chance to connect with friends—old and new—to receive fascinating updates from leading university researchers, and gave us the impetus to explore ways we can give back to my college and the University, which gave us such an incredible and transformative experience in our young lives.' Ralph Smith (Corpus Christi, 1973).

Insights into the Alumni Board

Oxford’s alumni community is comprised of over 300,000 alumni living in 90 different countries. Colleges, departments and the central Alumni Office all provide unique and compelling reasons for alumni to stay connected. One of the most important sources of input into what makes the alumni community tick is the Alumni Board. Oxford’s Alumni Board is made up of 24 individuals – 16 drawn from the wider alumni community and eight from the wider University and they are all dedicated to keeping the community a thriving and robust one.

The Board meets three times a year and serves to support and advise on the University’s alumni relations strategy. Amanda Pullinger (Brasenose) is Chief Executive Officer at 100 Women in Finance, and has been on the Board since 2016. She describes her reasons for serving on the Board: ‘Oxford has played such an important role in my life, giving me opportunities that I would never have had. As a result, I wanted to give back to the University and saw joining the Alumni Board as one way to do so. ‘Having lived in the USA for almost thirty years, I also felt it was important for American-based alumni to be able to contribute to the strategic development of alumni initiatives. I particularly enjoy interacting with alumni and faculty members from different colleges and different disciplines. Working with such a dedicated and intelligent group of people has been very worthwhile, and as you can imagine the debates on all sorts of topics are very vigorous and dynamic. It’s also been an opportunity to get to know the inner workings of the University and to offer up views on how Oxford can continue to be the first class university it has always been.’

The Board engages in a wide range of topics during its meetings. Currently, it’s helping to build a better understanding of the alumni lifecycle which in turn we believe will assist the University in shaping a meaningful and relevant relationship with its alumni over a lifetime.

For more information on the Board and its membership, visit www.alumni.ox.ac.uk/oxford-university-alumni-board
Let Oxford take you on a journey

Oxford Journeys is a carefully curated programme of extraordinary educational adventures, created exclusively for Oxford and Cambridge alumni, and their friends and families. Every year hundreds of Oxford alumni travel across continents and to all corners of the globe. Many of them book year after year, exploring new destinations and expanding their knowledge and minds. But what makes an Oxford Journey trip so special?

Our extensive range caters for all interests, from archaeology, architecture, art, astrology and astronomy, through to geology, history, ornithology, walking and wildlife. The itinerary for each journey is put together in collaboration with a carefully selected academic, each one a leading expert in their respective field, who accompanies the trip. This provides a unique opportunity to explore continents, cultures and civilizations in the company of a scholar who is an authority in your chosen destination.

You’ll enjoy illuminating lectures and gain fascinating insights that will challenge your thinking, and get an introduction to local experts and guides who really bring to life the history and culture of the country and its people. We also limit participant numbers for most trips to a maximum of 20, and our travellers always report that the lively exchanges and stimulating in-depth discussions with their travel companions make some of their most memorable moments.

Janet Langdon (St Hilda’s, 1958) who has travelled with Oxford Journeys five times, commented, ‘The lecturers share their fascinating expertise and research, and the local guides are really excellent at helping you understand the local culture. The trips are very personalised, and you always get a helpful reading list in advance.’ She added, ‘That shared experience of having studied at Oxford means that you all have something in common… you are travelling with kindred spirits.’ To book a trip, visit www.alumni.ox.ac.uk/travel.
Enjoy access to 1000s of academic journals

The Alumni Office has joined forces with the Bodleian Libraries and Said Business School to enrich your access to an exceptional collection of library databases, opening up a world of academic journals beyond your time at Oxford. You can access JSTOR with its searchable academic research articles from more than 1000 journals, as well as RefWorks, an online research management tool, and SAGE, which offers the full text of journals, plus a number of well-known information sources. In order to access the library database, please see www.alumni.ox.ac.uk/journals.

There’s still more to learn at Oxford

The late Sir Roger Bannister (1929–2018) joined Oxford’s Department for Continuing Education, taking numerous short courses in Philosophy and History, and receiving his Undergraduate Diploma in Creative Writing in 2009. He was the quintessential ‘lifelong learner’.

Oxford University’s Department for Continuing Education got its start 140 years ago, under the name ‘Oxford Extension,’ an initiative aimed at extending educational opportunity beyond the walls of the University. The impulse sprang from the general educational reforms of the later Victorian era, and from that period’s growing sense of social awareness. More and more citizens were being granted the vote, and access to education was a national imperative.

The early days of the programme saw Oxford dons jumping on trains to deliver weekly lectures at more than 150 ‘extension centres’, from Land’s End to Carlisle. For many, Oxford Extension was an intellectual lifeline that connected them to a wider world of ideas and higher education.

Today’s Department for Continuing Education offers more than 1000 part-time programmes and courses each year, on topics ranging from international human rights law to archaeology, and from literature to nanotechnology. More than 14,000 students enrol annually – students as young as 18, or well into their 90s – coming from more than 120 countries worldwide. Many study online, or come to Oxford to take part in short courses, summer schools, professional development, or part-time Oxford award or degree programmes.

PREVIEW: Meeting Minds in Oxford, September 2018

September’s Meeting Minds Oxford Alumni Weekend offers a chance to become acquainted with the Department for Continuing Education – and an opportunity to extend your stay in Oxford with a pre- or post-weekend lecture series:

‘The rise and current state of the novel’ - five lectures delivered by Dr Sandie Byrne, will take place Thursday 13 September to midday on Friday 14 September.

‘Crises of the past 100 years and their legacies’ - five lectures delivered by Professor Tom Buchanan, will take place Monday 17 September to midday on Tuesday 18 September.

On Saturday 15 September, as part of the official Alumni Weekend, hear Dr Nazila Ghanea, Associate Professor of International Human Rights Law, on ‘Should women be protected from religion?’ Dr Cezar Ionescu, Associate Professor of Data Science, will speak on ‘Soft concepts vs. hard facts - software models in the social sciences’. Lunch can be booked at 12.30 in the Rewley House dining room.

Booking information for all these events can be found on the Meeting Minds in Oxford website, at www.alumniweekend.ox.ac.uk

Find information about the full range of programmes offered by the Department for Continuing Education at: www.conted.ox.ac.uk
There’s a powerful idea circulating. It says that machines will overtake humans in intelligence later this century. This is the ‘singularity’. It’s a dystopian or utopian notion depending on your viewpoint, which for ethical purposes is a riddle that may have no solution.

This riddle lies at the heart of an intriguing book by Dr Paula Boddington (Corpus, 1980), a senior researcher in Oxford’s Department of Computer Science. Towards a Code of Ethics for Artificial Intelligence describes the singularity as a fear or expectation of ‘runaway control’, because an imagined machine pursues one value at the expense of humans – such as a machine manufacturing paperclips at the expense of anything and everything else (a fictional example tabled recently by Oxford AI authority Professor Nick Bostrom).

Google ‘singularity’ and the machine spits out this: ‘The technological singularity (also, simply, the singularity) is the hypothesis that the invention of artificial superintelligence will abruptly trigger runaway technological growth, resulting in unfathomable changes to human civilization.’ In the fields of physics and mathematics, the term has a different meaning concerning infinity and black holes.

Paula’s book is not about the singularity, but its weight and relevance in construing a context from which to discuss AI ethics is greatly bolstered by recent media hype about machine learning and the likelihood that we all lose our jobs as the machines take over.

Over a cup of tea, Paula says, ‘Actually this is an old idea, that a loss of perspective and balance is damaging to human well being, like King Midas turning everything he touches into gold.’

A softer example of this sort of loss of balance is the filter bubble (the title of Eli Pariser’s recent book), which Paula mentions in conjunction with the Tay Chatbot, an experiment in which a chatbot quickly found its way down to a world of hatred and extreme views having been programmed to operate within Twitter. ‘This revealed not the weakness of the chatbot but the weakness of Twitter. It can bring out the worst in human nature by filtering people towards entrenched points of view.’

In journalistic argot, the headline that particular experiment created was, ‘Twitter taught Microsoft’s AI chatbot to be a racist asshole in less than a day.’

With a broad background in behavioural and applied ethics, moral psychology and philosophy, Paula notes that not all examples are negative by any means.

If autonomous, self-driving cars halve the number of road fatalities by eliminating human error that would presumably be a good outcome, a moral good.

She mentions a totally different example arising from a concurrent but separate piece of research she’s currently undertaking into medical ethnography.

Dr Paula Boddington has a BA in Philosophy and Psychology from Keele, a BPhil and DPhil in Philosophy from Corpus Christi, Oxford, and an LLM in Legal Aspects of Medical Practice from Cardiff. She has held various lecturing and research posts in philosophy and in ethics, at Bristol, Cardiff, ANU and Oxford, and is currently working on a more comprehensive outworking of the book she has just published.

Main photo: A still from the film The Brain That Wouldn’t Die (1962), Joseph Green/Wikipedia.
‘Could a driver blame the machine for running someone over?’

‘I’ve noticed a surprising degree of overlap between medical ethics and the infant field of AI ethics,’ she says. ‘In practice there are situations where we could argue that patient human rights are not really met in hospitals. One right is access to a toilet, yet some patients go in continent and come out incontinent, a well-observed and troubling phenomenon. If a robot or ‘carebot’ helped you to the loo without falling over, that might be less embarrassing for the patient than calling for a nurse who is already under pressure, or reaching for a neatly stacked pile of disposable cardboard urinals.’

If these examples seem random and divorced from each other, that’s part of Boddington’s point in her book, which is broken down into eight chapters, each with up to 15 sections, much like an undergraduate textbook. One of these subsections, occupying just two pages, is ambitiously titled, ‘Is there such a thing as moral progress?’

I suggest that this can’t be answered in two pages, but she explains that her goal is not to provide any answers but to facilitate a conversation that ‘might otherwise be too restrictive, too myopic.’

‘For many, although not all, in the AI community, technology is progress and it can’t be held back. It’s too easy to extend the same unwritten assumption towards human progress or moral progress, in ways that are simply untrue.’

She adds that even defining Artificial Intelligence is problematic. ‘It’s very difficult to define AI. People who put definitions on it are often shot down by others. To me it means any situation where technology intervenes on behalf of humans, taking their place, or extending our reach, in thought, action or decision-making.’

I later realize that such a definition informs the several mentions in Boddington’s book of the Nuremberg Trials of Nazis that followed the end of World War Two. ‘The quintessentially bad excuse of the twentieth century was, “I was only following orders,”’ she writes.

The quintessentially bad excuse of the twenty-first century may yet be, ‘I was only following the dictates of a machine (or algorithm).’

She returns to the example of autonomous driving. In aggregate, fatalities may be reduced and road safety extended, but in particular instances could a driver blame the machine for running someone else over? The recent fatality involving an Uber vehicle trialling autonomous driving, shows how real these issues are. ‘We can’t yet say if people are more obedient to machines than to humans, but I think the very question begs for careful discussion…’

Recently at a conference in New Orleans and signed up to many more in 2018, Paula notes the current boom in this subject. ‘People are really asking these questions of the future, and what it’ll look like,’ she says.

But the readiness of cash-awash tech brands like Google and Facebook to sponsor the conferences might be interpreted as virtue-signaling rather than real engagement, at a time of unparalleled political scrutiny of their activities.

Given a preference for how the future should develop, Paula says that in the area of ethics she much prefers concrete proposals to merely aspirational ones. She contrasts the ‘very vague and aspirational’ charter of values called the Asilomar AI Principles (after the place in California), to the more practical work of the Institute of Electrical and Electronics Engineers (IEEE), which is working on ways of developing ethically aligned design for autonomous and intelligent systems.

‘That’s where the bit of my career currently focused on medical ethnography has had a surprising degree of overlap with AI ethics. There’s the theory of something, or ethics in this case, but then there is the practice.’

"We're certain that it's innovative, and we haven't seen anything like it elsewhere on the web," explains Dr Alex Pryce (pictured left), from Oxford's Undergraduate Admissions and Outreach team. For two years, Dr Pryce has been working with colleagues from all corners of the University to develop Oxplore, an initiative aimed at engaging young people and potential applicants through digital learning.

Referred to as the 'Home of Big Questions', Oxplore is an online portal through which users can learn about and debate the trickiest issues of our time, including whether guns hurt more people than they protect, and the impact of fake news. The website also tackles some of the biggest conundrums, asking us to consider life after death, to what extent money can buy happiness, and whether or not a god exists. Guided by Oxford academics, students are encouraged to consider fresh perspectives, and read and explore subjects further for themselves.

Alex says, 'The first indication is that it's a great success. We can see from our social media interactions and from the website analytics that schools and young people from hundreds of different locations across the UK are using it.' To date, over 40,000 people have used the site.

In many ways, this phenomenal success can be traced back to the very start of the project, and to the vision of the donor. 'One of the reasons why we think it's been so ground breaking is that in having donor funding we were able to be quite open in our initial brief, and really hit the ground running. It has allowed us to do something completely different,' says Dr Pryce. Before launching the website in October last year, the Oxplore team consulted widely with their target audience. Over 200 young people chose the name, selected the bold visual identity, submitted ideas for questions and even helped to inform the learning journey that users take through the site.

It was also during this early phase that the importance of social media became clear. 'We wanted to create something that could exist in the spaces that the target audience frequents,' explains Dr Pryce. 'We think that particularly for young people who might not conventionally interact with Oxford, it could really help to reach them on their mobiles and tablets while they're at home and just show them genuinely interesting ideas.' The team regularly posts content across Twitter, Instagram, Snapchat and YouTube. 'This is one way we can get young people on the site without the potential issues that the brand of Oxford might present,' she adds.

But social media is just one piece of the wider Oxplore puzzle. The initiative is an important part of Oxford's ongoing commitment to reach the best students from every kind of background, and there has been a concerted effort to integrate it with the University's existing outreach programmes. 'Oxplore does not exist in isolation,' says Dr Pryce. 'The idea is that it underpins all of the access and outreach work that's going on right across the University.'

To this end, the team have been working closely with access officers from Oxford's colleges, departments and faculties to help disseminate the Oxplore content. 'The idea is that there's sustained engagement with young people,' explains Dr Pryce. This approach is particularly key for young people who are geographically distant from Oxford, such as those living in the North East, Wales, East Midlands and Yorkshire and the Humber – areas where students are statistically less likely to apply to the University. For both Oxford and the donor, being able to reach out to the entire country in this way, including even the most rural and remote of areas, was the initial inspiration behind the programme.

In December, the Oxplore team attended a two-day student conference organised by the Welsh government, where they ran eight Big Question workshops and met with over 200 young people in Years 11 and 12. After the event, there was an upsurge in interest from Wales on the website.

As well as enjoying a positive reception from young audiences, Oxplore has also been extremely well received by teaching staff across the UK. In fact, one unexpected outcome has been the establishment of Oxplore clubs within schools. 'It's all about big thinking, super-curricular learning and students following their passions. It's been great to hear about,' says Dr Pryce. The next step is to create even more resources for teachers. 'Teachers want their students to have the best possible learning experience, and so we want to develop something that responds to their needs,' she notes.

For those involved in developing Oxplore, it has been a rewarding journey. 'We all feel extremely passionate about the mission of the site. It's genuinely something really exciting to be working on,' says Dr Pryce. 'For me personally, having the opportunity to inspire this “big” thinking has been a wonderful experience.'
No tutorial deadline is met without a degree of enterprise, suggesting that the entrepreneurial spirit has deep roots at Oxford. However, a deeper transformation has taken place in recent years. Universities generate knowledge and have become more and more central to the ‘knowledge economy.’

Today at Oxford, students, researchers, faculty and alumni receive extensive support to turn ideas and discoveries into ventures, ranging from licensing intellectual property, to writing a patent, crowdfunding a start-up or structuring a spin-out company.

While there is still a ghost of past conflicts over ‘useful’ knowledge versus ‘disinterested inquiry’, the new reality enjoins both. Perhaps above all, the days of seeing Oxford as the ‘arts’ counterpart to Cambridge are long gone. Instead, both universities, plus London, form a regional belt of innovation into which much resource (and 1 million houses) will be pumped between now and 2050.

The measure of success for Oxford is impact as well as monetary profit. So diverse are current developments that we’ve mapped them. By no means exhaustive, this map depicts a different Oxford to the one that we’re all familiar with, yet a very exciting one. Between Begbroke Science Park to the north of the city, and Magdalen’s Oxford Science Park, Culham and Milton to the south, sit a profusion of new developments. The University’s tech-transfer specialist Oxford University Innovation is in Botley, and Oxford Sciences Innovation, the world’s largest university venture fund (£600 million), will shortly move to Keble College’s H.B. Allen Centre on the Woodstock Road. Late last year the University raised the largest bond ever raised by a UK university, £750 million, allowing investment in strategic capital projects. Offering a welcoming hub for biomedical research is the Bioescalator, which opens this summer on Old Road Campus.
Oxford Anagama

Since 2015, Dr Robin Wilson, Research Associate in Oxford’s School of Anthropology, has led a unique joint venture with UK ceramics legend Jim Keeling (pictured), of Whichford Pottery. They recreated, at Wytham Woods, a twelfth-century Japanese anagama kiln, to map and analyse the ‘making of meaning’ across two very different cultures of craftsmanship. A new kiln for 2018, funded by Daiwa and Sasakawa foundations, opens up wood-firing techniques to school groups and ceramicists, further connecting this craft to university research and teaching. robin.wilson@admin.ox.ac.uk

The Oxford Foundry

Opened in October 2017, the Oxford Foundry extends the provision of entrepreneurial support to all University students irrespective of subject. Situated close to Saïd Business School, the cool and understated open-plan space was sponsored by LinkedIn founder Reid Hoffman (Wolfson, 1990). Foundry Director Ana Bakshi notes, ‘the entrepreneurial mindset is all about a willingness to learn through commercial experimentation and to embrace uncertainty and the risk of failure.’ The second cohort of ten alumni enterprises take up supported six month tenures at an ‘accelerator’, this summer.
Fuel3D at Oxford Science Park

Spun out of Oxford in 2005, Fuel3D specialises in high-tech scanning technologies such as a subcutaneous tumour scanning application for use in pre-clinical oncology. The rapidly growing company will be the first occupier of the new Erwin Schroedinger Building, a £13m office and laboratory building that will house up to 400 people when fully occupied. Created in 1991, the Oxford Science Park is owned and managed by Magdalen College and is home to over 75 businesses, among them Oxford Nanopore Technologies, OxSonomics, Oxford Genetics, Circassia, IBM, OrganOx, Prolimmune and Oxford Technology Management.

Oxford University Innovation (OUI)

CEO Dr Matt Perkins (pictured above right) reports that Oxford’s innovation scene is off to a fantastic start in 2018. ‘In our spin-out trophy case, we have added another five champagne corks, popped at this year’s spin-out launches. At this rate, we are on course to add a total of 20 or so corks by the year end. We’re calling this explosion of innovative output the Oxford Boom, and it is growth that is being sustained. Oxford has now created over 150 spin-outs in the past thirty years with a third of them in the last three. Oxford is positioned as a leader in this field in the UK and puts the University on par with peer institutions in the US and the rest of the world. In 2016, UK universities created a total of 51 spin-outs – 21 of which were from Oxford.’

Perkins continues, ‘Creating spin-outs is only one part of the story; Oxford’s burgeoning innovation cluster is evolving rapidly. The OUI team work tirelessly to support innovation, within both the University and the wider cluster. Working closely with our colleagues in social sciences and humanities, we help to develop their ideas and crystallise the University’s vision on social enterprises. In partnership with the Development Office, the OxReach crowdfunding platform is continuing to fuel ideas such as Greater Change, an app facilitating secure, cashless donations to the homeless. LAB282, our £13m drug development partnership with Evotec and Oxford Sciences Innovation, has backed 12 projects in its first year of operation. The Bioescalator, a purpose-built facility to support life sciences innovation, will open shortly. Universal flu vaccine company Vaccitech has raised £20m from Google while DNA-sequencing firm Oxford Nanopore surpassed £1.5 billion in market value.’

Inkpath, a humanities spin-out

Inkpath’s roots can be traced back to a balmy week in late July 2013, when Dr John Miles (pictured), now Chief Technology Officer, started a job at the University as a training officer for the Humanities Division. John set his mind to a straightforward problem: ‘how can we help students and researchers track their personal and professional development in an engaging, meaningful way, helping them towards exciting and fulfilling careers?’ A bit of coding later (OK, more than a bit), John had produced a working prototype of a skills tracker, which he piloted with students from Oxford’s Humanities faculties.

Their feedback was so encouraging that John applied for funding to take the project further, gaining support from within and beyond Oxford to turn his dream of a mobile and intelligent 21st-century career app into reality. Inkpath is the result: after working with Oxford University Innovation and bringing on board a CEO, Jason Barlow, the company was formed and spun out of the University in July 2017.
Oxford Sciences Innovation (OSI)

Formed in 2015 by Dave Norwood (Keble, 1988) OSI is a private company in which the University owns a stake. It has super-charged the spin-out activity of Oxford’s Maths, Physical, Life Sciences and Medical Sciences Divisions, which include Computer Sciences and Engineering. It has so far raised £600m in venture capital, making it the largest venture fund of its kind in the world. The company describes its mission as ‘Turning a thousand years of world-beating science into the next generation of world-leading companies.’ If OUI exists to define and shape the initial moves of a spin-out, OSI offers the financial firepower to scale up such ventures. Investors in OSI range from Sovereign Wealth Funds to large fund managers such as Lansdowne Partners and Invesco. University spin-out specialist IP Group is an investor, as is the University’s own endowment manager Oxford University Endowment Management (OUEM).

Oxford Immunotec at Milton Park

Head a few miles down the A34 from Oxford and suddenly you’re at Milton Park, one of Europe’s largest business parks. It has no formal relation to the University but illustrates the broader regional vibrancy of the ‘Oxford to Cambridge Arc’, and the role the University has played in it. MEPC, the company behind the Park, has just developed, at a cost of £24 million, two new buildings equipped with high-tech offices and laboratory facilities. One of them, 143 Park Drive, will be occupied this year by Oxford Immunotec, the NASDAQ-listed, high-growth diagnostics company focused on developing and commercializing proprietary tests for the management of underserved immune-regulated conditions. This is the sort of downstream development the University wants to see, where spin-outs don’t just survive but really catch fire. Originally a University spin-out founded in 2002 with £400,000 in seed funding, Oxford Immunotec now has over 500 employees and has grown into a global leader in its field. Founder and current CEO Dr Peter Wrighton-Smith (Magdalen, 1993) earned his MA in Engineering, Economics and Management, and then his DPhil, also at Magdalen, in medical engineering.
America at the Ashmolean

The Ashmolean Museum’s latest exhibition showcases precisionist high modernism

Not ‘cool’ as in ‘groovy’, says exhibition curator Dr Katherine Bourguignon, but ‘cool and calm and collected’, and ‘clean and precise and efficient’.

This particular strand of early-mid 20th-century modernism wrestles modernity to the ground and renders it motionless. What defines the American approach is a machine aesthetic that seeks to disguise its brushwork in an illusion of not-artness, hence the term ‘precisionists’ as a term to sometimes describe some of these artists, but not as it turns out, Hopper.

Above all, and far away from the teeming, all-too-human filter of the ‘roaring twenties’, these paintings are more often than not without human subjects. If they are not colourfully abstract as in the manner of Edward Steichen’s Le Tournesol (The Sunflower), c.1920, or gaudily energetic with the big city vibe as in Charles Demuth’s I Saw the Figure 5 in Gold (1928), then they are absolutely still and sober as in Charles Sheeler’s fantastic Americana (1931), an interior that links to Shaker art and offers a Protestant lineage for the minimal and utilitarian.

Speaking of Sheeler’s Americana, this is the first time the painting has ever left the US. Sixteen other works are also abroad for the first time, underscoring just what a coup this exhibition represents for Ashmolean Director Dr Xa Sturgis. The Chicago-based Terra Foundation for American Art has provided 27 works of art, while the Metropolitan Museum of Art, New York, has supplied a further 18.

Sturgis notes that not a single piece in the exhibition belongs to the Ashmolean. ‘The point is sometimes to shed new light on something familiar, but in this case it is instead to tackle something completely new, at least to a primarily UK audience.’

Some of the paintings are very well known in the pantheon of American modernism. Demuth’s I Saw the Figure 5 in Gold took as its motif a gold number 5 seen on the side of a bright red fire truck hurtling through a grey city. Integral to it is a not so subtle dedication to the poet William Carlos Williams. The Australian critic Robert Hughes said of it, ‘one picture so famous that practically every American who looks at it knows it’.

Yet by no means are all the artists here household names even in America. The culmination of the ‘cool’ trope, arguably, comes in (ironically) rural scenes where the emptiness of the American landscape serves only to intensify the human-lacking scale of industrialised farms. Ralston Crawford’s Smith Silo, Exton (1956–37) and Buffalo Grain Elevators (1957) are unquestionably high points in this approach, as interesting for their smoothed technique as for their stark subject matter.

O’Keeffe is there and Hopper is there, bookending the show for a sense of crowd pleasing big names, yet neither quite fits the precisionist billing. If you focus on what you don’t recognise here, as opposed to what you do, the exhibition is a cracker.

See p.7, new Visiting Professorship in American Art
PICTURES CREDITS: ASHMOLEAN MUSEUM FOR PROMOTIONAL PURPOSES ON BEHALF OF NUMEROUS OTHER COPYRIGHT HOLDERS.
The truth about toxic air
A perfect storm has brewed up around air quality. While media images of smoggy Delhi and Beijing have become ubiquitous, Europe faces its own crisis. The World Health Organisation says that dirty air may be the leading single cause of premature mortality by 2050. It is already the fourth largest cause after high blood pressure, diet and smoking. Rapid industrialisation and wood or coal burning for domestic cooking are part of the problem in China, as they were in London in the great ‘pea soupers’ of December 1952.

The difference between then and now, in London, much of Europe and select markets such as South Korea, is that the pollution is less visible but no less insidious. Transport is by no means the only cause, but it’s a growing cause. Extensive ‘dieselisation’ of the car market has brought in its train a great cloud of poisonous nitrogen dioxide (NO2) and lung-choking particles. Europe’s pro-diesel policy resulted partly from a technical competence in carmakers, who lobbied Brussels furiously, and partly from the knowledge that diesel combustion produces 10-20% less carbon dioxide, the gas associated with climate change. But the unintended consequence of this apparently virtuous policy has been extensive local pollution that has only intensified as Europe’s fleet of approximately 50m diesel vehicles has expanded and aged.

Oxonian Nick Molden (Christ Church, 1992), supported by his chairman Eric Verdon-Roe (Exeter, 1972) has found himself at the frontline of the vehicular aspect of this dirty air problem, which accounts for approximately half of Europe’s air pollution, the rest coming from agriculture, industry and boilers.

Sitting in a large industrial unit in Stokenchurch, the pretty town atop the Ridgeway where the M40 carries incessant traffic from London to Oxford, Molden points out that the company he founded in 2011, Emissions Analytics, was not intended to solve the problem of air quality. A self-confessed consumer champion, he instead ‘wanted to blow the fresh air of data into the murky world of fuel economy’.

By then, it had become commonplace for car owners to send angry letters to the motoring columnists of newspapers and magazines, asking why they could not match the claimed fuel economy for their car. But no one had penetrated to the heart of this problem, a problem that Molden considered to be a consumer rip-off amounting to mis-selling.

He says that today, the average discrepancy between claimed fuel efficiency and real fuel efficiency is about 35%, and growing.

The main reason, Molden explains, is that the European Union-sanctioned test is both unrealistic and has been ‘gamed’ by carmakers. Although now being tentatively phased out for a new Real Driving Emissions Test (RDE), the old, discredited test remains the main benchmark. RDE won’t fully apply until 2021.

In the meantime, Molden has built the biggest database of real world emissions. Back in 2011, he began to conduct real-world emissions tests on cars using well-established Portable Emissions Measurement Systems (PEMS).

‘The equipment, from a company in Michigan, was well established and not in doubt. The achievement has been to learn how to use it reliably and repeatedly to establish the truth about car and van emissions.’

He chose Stokenchurch as the main base for Emissions Analytics because it allows car testing across varied terrain, including hills, urban driving and crucially the motorway. Molden also has joint ventures in Stuttgart, Seoul, Los Angeles and Detroit.

Surrounded by walls festooned with PEMS equipment and technical hardware, I find it impossible not
to want to cut to the chase and ask: what is the cleanest, most efficient car on sale in 2018?

Molden explains that he can tell you how efficient a car is (fuel efficiency and CO2); and he can tell you how clean the car is for air quality purposes. ‘But we can’t give you a combined rating for both because that would require making a value judgement between climate change and air quality, and that’s not our business.’

He adds that the best hybrids have become more efficient while the best diesels (albeit just a handful in a sea of dirty ones) have become much cleaner. Petrol is somewhere in the middle but has a problem with ultra-fine particles and higher CO2. While full electrification is poised to take off, it remains in its infancy.

With diesels still being made and sold in vast but declining numbers, are any of them really viable in 2018?

Molden replies that a handful match the stipulated regulations for nitrogen dioxide emissions, 14% to be precise, but the other 86% are in breach, by up to 15 times the prescribed limits. There’s no polite way to put it. In terms of the NOx emissions, most of them are filthy.

At an air quality conference held in London in December 2017, the UK Environment Agency’s Senior Air Quality Advisor Jim Storey publicly thanked Molden for successfully shining a bright light on this otherwise dimly understood subject.

Molden’s frustration is that despite all the great fuss over dieselgate, the huge Volkswagen scandal that blew up late in 2015, lessons have not really been learned. ‘Governments are now drawing up clean air zones for city centres, but they are allowing in vehicles meeting the discredited Euro 6 regulation. The result will be policy failure in respect of air quality. They have failed to discriminate between clean and dirty cars.’

He says, ‘Most petrol cars are good on nitrogen dioxide but less efficient [than diesels and hybrids], and face other issues such as ultra-fine particles – in fact they are starting to be equipped with particulate filters for this reason.’

When I admit that I’m a cyclist Molden warns me to worry more about downsized petrol engines than diesels. All diesels have been equipped with particulate filters since around 2011, but not petrol engines.

There’s a ray of light with battery electric vehicles (BEV). Electric motors, explains Molden, are 85% efficient, whereas even the best internal combustion engine is only 30-35% efficient. But the issue then becomes one of cradle to grave, life-cycle ‘cleanness’ (where do the batteries and their ingredients come from, and can they be re-cycled?). Above all, electric car owners should ask themselves whether the source of their electricity is green or brown.

Nick’s team of technicians has now tested over 2,000 vehicles, more than any other organisation in the world. ‘The single message I would want to transmit to car buyers is to discriminate.’

Molden has publicly published his test data to enable just that. The EQUA Index allows car buyers to check prospective purchases for fuel economy and air quality.
‘86% of diesel cars entering Clean Air Zones permitting the Euro 6 standard, will be in breach of permitted NOX limits’

One thing the EQUA Index shows is how little consistency there is within a single brand of car, one of the central issues being that larger diesel cars and SUVs are often cleaner than small or medium-sized diesel cars because they are fitted with a special NOx-reducing technology called Selective Catalytic Reduction (SCR). BMW occupies slots at both ends of the clean-filthy spectrum, showing that being premium isn’t any guarantee of cleanness.

Nonetheless, over half the cleanest diesels currently on sale are from VW group brands, while the dirtiest seem to cluster around second-tier Japanese brands, Renault-Nissan and Fiat-Chrysler. The very popular, UK ‘school run staple’ Nissan Qashqai, model year 2016, 1.6 litre diesel, gets an absolutely lousy H rating, indicating that it is in breach of NOx limits by over 12 times.

The trouble is that such vehicles would be illegal in the US but they are not illegal in Europe, says Molden. ‘When dieselgate broke a lot of journalists came to me. They all wanted to know if VW had fitted the same defeat device in Europe,’ he recalls. ‘But if they had, they didn’t use it in the same way because they didn’t need to. Permitted emissions for nitrogen dioxide are much higher in Europe than in the US, where diesel cars were, and still are, rare.’

Molden’s company makes money by selling data and custom testing services to carmakers and regulatory authorities. He says that the absolute key requirement is maintaining strict independence as an engineering consultancy. ‘We’re a “publish and be damned” model, beholden to no particular group or interest.’

Molden lauds the clarity of mind that he acquired from an Oxford PPE degree, although adding with hindsight irony that he focused mainly on the economics and philosophy components, discarding the politics.

His other achievement is becoming a successful media spokesman, not just for his company but on the wider subject of air quality, a competence he puts down partly to his student days when he co-founded student radio station Oxygen FM, ‘the illegitimate love child of Radio One and the World Service’, he recalls with a grin.

On the future of the private motorcar he is sanguine. Unless there is massive and sustained subsidy of public transport, cars stand to get more rather than less popular, he predicts. ‘Electrification will reduce operating costs, while autonomous technology will address the expected increase in congestion, by allowing drivers to be more productive while they sit in traffic jams.’

Is he a petrolhead, I ask? No. Eric Verdon-Roe, the chairman, counts himself a car connoisseur, but Molden’s affinity to the sector is premised on his love of data.

‘Whereas fridges are pretty similar to each other, cars are broadly similar and heavily regulated, yet exhibit numerous differences. You can specify a car with a tractable number of fields. It’s a large number, but a tractable number. Cars are very different from each other but not too different, and the market is huge. Such a characteristic suits data applications.’

‘At the end of the day I believe that cars are part of the solution here. Family logistics and the demands of employment will mean that cars continue to be a crucial part of the economy. They can be clean and the point is to adopt the clean ones and ban the dirty ones.’

Wondering if the advent of electric vehicles will render his company obsolete, Molden insists that to the contrary, the challenge is to create data and databases allowing comparison between different types of propulsion.

‘Everyone knows that if the electricity for an electric car comes from a coal-fired power station the resulting car is not ‘green’ except at the point of use. In fact it could be a disaster from a climate change perspective.’

He adds that his team has just finished testing a Tesla, the Model 3. ‘We are building the EQUA Index to achieve like-for-like comparisons across all types of car – becoming a global, independent benchmark, rather like NCAP with vehicle safety.’ Towards this end he has the support of a growing lobby of politicians and pressure groups, including Allow Independent Road Testing (AIR).

Long gone are the simple days of a century ago, when there were far fewer cars and petrol ruled. Cars are today at something of a crossroads, with lots of competing fuels and technologies. Globally, there are over one billion of them and that figure is projected to triple by 2050. Avoiding the worst climate change scenarios and an air quality public health disaster will mean embracing radical change.
No icing* needed

In an historic centenary match, Varsity ice hockey returned to its original venue in the Swiss Engadin, at St Moritz.

Oxford may have lost the Boat Race on 24 March, but just hours later it gained revenge at the 100th Varsity Ice Hockey Match. Deep in the Swiss alps, the two teams faced off at the outdoor ice rink owned by the Lyceum Alpinum boarding school in St Moritz.

In a close fought and thrilling match, Oxford eventually prevailed with a ‘sudden death’ goal shortly into overtime.

When the match began at 8pm in bitterly cold conditions, Cambridge initially looked the stronger.
side. But Oxford took control and scored twice. That initial edge, plus two previous victories against Cambridge in the domestic league, gave the dark blues a psychological advantage. While Cambridge threatened, with a sparkling performance by the towering Wilbys, it was finally Canadian Chris Byrne (Kellogg, 2015) who scored for Oxford, after receiving a pass from behind the Cambridge net from Will Andrews, sliding the puck between the goalie's pads and ending the match 4-3. By then the mercury had plunged to minus 13 degrees C.

The contest saw student-athletes participating from the United Kingdom, Canada, the US, Sweden, Finland, the Czech Republic, Slovakia and Australia.

Famous former ice hockey dark blues include Canadians Lester B Pearson (former Canadian Prime Minister and Nobel Laureate), Clarence Campbell (former NHL President and Chairman), Mark Carney (Governor of the Bank of England) and John McCall MacBain O.C. (philanthropist and entrepreneur).

Icing: an infraction when a player shoots the puck across both the centre red line and the opposing team’s goal line, and the puck remains untouched.


drug
No ordinary friends

Oli Glanville (St Catz, 2013) and George Randell (Trinity, 2013) have triumphantly rowed across the Atlantic Ocean in 37 days, beating the previous world record by 2.5 hours but conceding first place to another duo in the 2017 Talisker Atlantic Whiskey Challenge.

Lows included being capsized three times in a boat that won’t sink or lose its strapped-in occupants. The shock was nonetheless immense. ‘It tended to happen at night when there was no moon. You couldn’t see the wave before it hit the boat.’

On another occasion their freshwater-making device didn’t have quite the power it needed (from a solar trickle-charge) and they had to ration their water – 'a bit scary because 750ml per hour isn’t really enough’, says Oli.

In a broader sense, notes George with a laugh, ‘the conditions are never right. If it’s flat calm you are rowing the entire weight of the boat, roughly a tonne, and it’s like treacle. If the sea has a bounce to it you are battling the wind in other ways.’

When they set out it was often cool to cold, but by the end as they reached Antigua, it was ‘far too hot for comfort’. They encountered two serious storms and a tropical squall, the intensity of the last exceeding anything they had ever imagined.

‘Highs’ included having a pod of five pilot whales come to within ten metres of their boat, and being tailed by a huge shark. There were many dolphins and innumerable flying fish. George found a meditative state that lasted approximately a week. ‘You would find yourself completely immersed in the moment, perhaps thinking about a person or an experience, but firmly in the mid-Atlantic, in the moment.’ He says that this state eventually turned back to normal ‘and the pain returned, as the fatigue piled up’. Raising money for two charities, both with links to Oxford research – Alzheimers Research UK and Against Malaria Foundation, the Oardinary Boys will continue to fundraise until September 1, 2018. They are already above £50,000 for the charities, having first pulled together a massive effort spanning families and friends in 2017 to merely reach the start line. The naming of the team was simple. Every team had to have a pun in their names, ‘ordinary’ denoting that neither Oli nor George ranked themselves rowers as such.
The author (St Hugh’s, 1966), President of the British Society for the History of Science and a fellow of Clare College, Cambridge, makes a fantastic point early on that the official war artists of the Great War forgot half the population and a third of the country’s employees: the women. Long into the war in 1918, the Imperial War Museum commissioned Anna Airy to produce four pictures showing women engaged in heavy wartime labour – building aeroplanes, running gasworks, making munitions. The over two metres-wide painting Shop for Machining 15-inch Shells, Fara observes, obtains a glimpse at the hard truth about how the war ‘transformed the prospects of women’, not least because it displays working conditions that had prompted men to go on strike before the war.

It is this sort of ‘mixed blessing’ that characterises a landmark book that deftly picks apart the contradictory and often competing sensitivities between different groups of women, many of them champions of female empowerment and suffrage but not necessarily suffragettes (the term coined by the Daily Mail in 1906 to capture a growing, more militant group).

Fara is clear. The Great War neither set women free, as some argued, nor did it ‘clang shut’ the door on them as the men streamed home from the Western Front. Something had changed forever, but it was hard going; many men did reclaim their former jobs and positions, and (golly!) we’re still stuck in spin cycle a whole century later with plain and awkward lack of representation of women in science.

Another luminous point among many made by Fara is that Vera Brittain’s Testament of Youth ‘appeals to readers by portraying two stereotypes – the naïve upper-class volunteer who undertook menial tasks in French hospitals, and the lovelorn faithful innocent who lost her fiancé to the patriotic cause’.

Somewhere between Brittain and the great mass of uneducated women, many of whom went sideways from domestic service to a munitions factory, were a numerically much smaller but by no means negligible group of highly educated female scientists, ‘who spurned Pankhurst’s tactics and donned masculine uniforms to carry out men’s jobs – surgery, chemical research, aeroplane design’. How odd it is, says Fara, that this group is ‘scarcely remembered.’ The book is about those women, Rachel Costelloe, Ida Mann, Philippa Fawcett, Hilda Hudson, and many others, often the product of Newnham College.

A Lab of One’s Own: Science and suffrage in the First World War
By Patricia Fara
Oxford University Press, £18.99
One of the central points made by the author, also the founding Director of the Oxford Martin School and a former Vice-President at the World Bank, is that getting from poverty to prosperity nowadays involves far more than just ever-rising economic growth and financial wealth. Quite apart from renewed concern about rising inequality, it involves education, gender equality, healthcare and a vision of environmental sustainability, the very elements enshrined in the UN Millennium Development Goals. Seen this way, of course, the traditional polarity of ‘developed’ and ‘developing’ nations gets confused. This confusion is particularly evident if you throw climate change into the mix, given that the wealthiest countries have the highest per-capita carbon footprints. It might mean that rich nations are the ‘third world’ when it comes to environmental sustainability, although the author only touches on such an inconvenient truth.

Of course other elements such as the rule of law and good governance can still reveal a more traditional distinction between countries that have done well and others that have not. Corruption and development do not mix well. War isn’t helpful either, with apparently no fewer than 624 non-state conflicts having erupted since the end of the Cold War in 1989.

A section titled ‘Global Public Goods’, from p.86, is very encouraging, noting how well-directed aid from multilateral or bilateral donors can benefit, for example, the natural environment or public health. There is no ‘downside’ or counter-argument to the evidently brilliant success of the Onchocerciasis Control Programme established in West Africa in 1974, to combat river blindness. Yet if rising human population is the most basic evidence of successful development, how much is too much? The book ends on a cliffhanger presaging, possibly, a gigantic human own-goal. Noting the tenfold increase in middle-class consumers, to 5 billion in the next few years, he says, ‘This triumph of development is a cause for celebration. But…’
As Kingfishers Catch Fire
By Alex Preston and Neil Gower. Bloomsbury, £85

A price-defying and really quite beautiful book production by Corsair, the author (Hertford, 1998) takes his cue from Great War Foreign Secretary Edward Grey’s 1926 The Charm of Birds, indulging a similarly delightful comingling of observation and reminiscence, in this case passed through an ample filter of literature. The author watched birds as a boy and picked up the habit again once he’d shaken free of the City. Now a lecturer at the University of Kent, his critical nose is abreast of the British canon of bird writing, even with the odd German contribution, but it’s worn lightly. Each chapter a bird ‘trapped for a brief moment under the nib of a pen’, and the pens of others, we learn about the peregrine, the swallow, the kingfisher, the kestrel, the gull, the starling, the wren, the skylark, the nightjar, the swift, the peacock, the goldfinch, the robin, the grey heron, the crow, the curlew, the waxwing, the collared dove, the snow goose, the barn owl and the nightingale. The list is an unofficial canon of ‘literary’ birds, but Preston, aided by illustrator Neil Gower, aims to set off ‘little detonations of recognition’ and invariably he succeeds. Apparently Gilbert White thought that swallows hibernated in ponds if afflicted with cold weather, while gulls are invariably wounded, kestrels lower class and starlings populous. But overall birds fascinate because they typically defy anthropomorphising and are ‘envoys from the world’s hidden places’. They sing loudest at the ungodly hours of dawn, and that’s the point.

To honour the late Anne Glyn-Jones (1923–2017; LMH, 1945), is to acknowledge the absolutely fresh, vibrant tone of this, her memoir of the Second World War. She served as a Wren intercepting German Morse Code for the Y-station near Winchester. Station X stood for Bletchley Park, but it was a secret for years. She didn’t like Oxford in its repressive post-war mood, but credited it ‘with giving me a good education’. Oxford’s Professor of History of Science, Rob Iliffe unlocks the largely neglected religious side of Sir Isaac Newton (1642-1727). Britain’s greatest scientist also wrote over two million words on prophecy. The man who created calculus, classical mechanics, and the laws of motion and universal gravitation hated the pope, rejected the doctrine of the Trinity and was committed, one sees, to religious liberty and to political toleration. The former Professor of Physical Chemistry and fellow of Lincoln brushes up against a view of humans guided by indolence and anarchy, suggesting an acquaintance with students! But this clever yet lightly worn account of the Universe argues that the Big Bang wasn’t a bang, and that something can come out of nothing, and it still finds room to celebrate German mathematician Emmy Noether (1882-1935).

This latest ‘Very Short Introduction’ is a handy reminder that the world now has 150m students being served up Medieval-originating BAs, MAs and PhDs by 17,000 institutions. The arrival of the knowledge economy is making universities more important, but the resulting political pressure threatens autonomy. The many references to New College, Oxford are purely coincidental.

Morse Code Wrens
By Anne Glyn-Jones
Amphora, £10

Priest of Nature
By Rob Iliffe
OUP, £23

Conjuring the Universe
By Peter Atkins
OUP, £15

Universities and Colleges
By David Palfreyman and Paul Temple. OUP, £10
Music

Poet Roger Garfitt (Merton, 1963) has honoured the Shropshire Romantic novelist Mary Webb (1881–1927) with a series of poems set to contemporary jazz composed by Nikki Iles and played by the John Williams Octet. The Octet fronts a trumpet, alto saxophone, tenor sax and baritone sax, but the players double with a flugelhorn, flute, soprano sax, two bass clarinets and a recorder. Garfitt explains that he felt the need for a rich sound palette to try and recapture the ‘different shades of light in the Shropshire landscape’ that Webb was so expert in catching. Iles draws on ‘Finzi more than Vaughan Williams, which is what gives the sense of jazz infused by the English lyrical tradition’.

In its own special way another tribute to the Great War, the sequence culminates in ‘The Haunting’, which Garfitt notes is ‘a sideways glance at [Webb’s] ‘Gone to Earth’, which she wrote during the First World War and which takes on a whole other level of meaning if you read it in that context’. Re-stringing the Lyre is a new label, also by Garfitt, and this is its first recording.

Bikes and Bloomers

Victorian Women Inventors and Their Extraordinary Cycle Wear
By Kat Jungnickel
Goldsmiths Press, £24.95

Anyway, women responded very cleverly with ‘transformer’ garments that were bicycle friendly one moment, and respectable the next. Around it swirled the Rational Dress Society, from 1881, and as Jungnickel argues, the other great event here is that women patented their ingenious clothing technologies and in so doing participated in the otherwise male world of commerce and intellectual property. At the end of all this, the ‘New Woman’ and a brave new 20th century, eventually leading to lycra...

In All My Holy Mountain
Roger Garfitt, Nikki Iles and the John Williams Octet
Re-stringing the Lyre, £10
www.jazzcds.co.uk

A ‘mixed methods account of cycling, sewing and suffrage’, says the author of this lively piece of scholarship, who in April visited Oxford on a vintage bicycle to explain her work. At the centre are two technologies of the 19th century that swept all before them in the 1890s: the bicycle and the sewing machine. Around them a gender revolution of sorts, as middle-class women took up the harmless (one would have thought) pursuit of pedalling, often to the utter fury of their menfolk.
Some QUAD readers may have followed Oxford’s distillery TOAD via our recent reader competition, the prize a bottle of Oxford dry gin.

But on 31 January, 2018, everything went up a gear with the launch by TOAD founder Tom Nicolson and Professor Simon Hiscock, Director of Oxford Botanic Garden and Arboretum, of a much-anticipated Oxford Physic (physicke) gin.

Hiscock met Nicolson, as you do, in an Oxford pub, and the conversation has resulted in a three-year collaboration between distillery and University. Into the gin have gone 25 botanicals including not just angelica and juniper but wormwood, rue and sweet woodruff.

According to Master Distiller Cory Mason, the resulting 42.1% abv spirit takes us ‘back to the time when plants formed the base of all medicine’.

QUAD isn’t qualified to judge, but a member of the drinks trade has already raved over this gin, insisting that the sum of flavours is greater than its parts, and yet that the different fractions can be drawn out in a formal tasting unlike the vast majority of gins that have crashed the party in recent years, the UK currently being in the grip of a veritable gin craze.

Professor of Botany Hiscock shared, at the launch, a private view of the 1648 catalogue of plants that the first keeper Jacob Bobart the Elder compiled 27 years after the Physicke Garden was first opened in 1621.

In a nice twist, Hiscock mentioned that Bobart had been the landlord of a local Oxford tavern. In order to sell the new gin in the Botanic Garden Shop just inside the Danby Gate, opposite Magdalen College where the Cherwell River meanders towards the Thames, he had to take his first exam since 1985 – the one you take to have a licence to sell alcohol.

Physic Gin is available in 50cl bottles (£34.95) from The Oxford Artisan Distillery at Cheney Lane (above South Park) and later this spring in the Botanic Garden Shop. For other retailers see www.spiritoftoad.co.uk

Win a toad tour!

QUAD readers can email their entries to: richard.lofthouse@admin.ox.ac.uk, answering the following three questions correctly to be eligible to win one of six Founder’s Tours of the Toad Distillery plus a discount on any spirits then purchased:*

1. How many botanicals go into the Oxford Physic Gin?
2. What alcoholic strength is the Oxford Physic Gin?
3. Oxford’s Physicke Garden, today the Oxford Botanic Garden, first opened in which year?
Prize valid for the whole of 2018.

PLEASE PLACE ‘PHYSIC GIN’ in the subject line of the entry email, and then college and year of matriculation in the body of the email.

Winners of the draw will be notified by email by 30 June 2018. Entrants must be over 18.
How did you end up at Oxford?
I was an international chess master at 16. The Times chess correspondent Ray Keene told me to try Keble owing to the presence there of a famous correspondence chess-playing fellow, Adrian Hollis, so I applied. But there was no shoe-in. Hollis wasn’t there and I didn’t prepare adequately. I was rejected. After a self-imposed chess ban and lots of study, I came back a year later with the grades I needed. Along the way, I relentlessly contacted the medievalist tutor Dr Eric Stone. Although bemused, I think he eventually saw that I was very motivated. The gates swung open.

What were your tutors like?
It was a seminal life moment for me, getting in to Oxford. I’d attended a secondary school in Lancashire and my father was an electrician. Getting in after an initial rejection, was a great life lesson, that there are rules, yet you can also be creative. But I was very cocky. As it was, Eric (Stone) took me under his wing. He was an amazing man. At the time I had no idea that he was one of the great architects of modern Keble. Once when I was being cocky, he poured some sherry, slowed down and then cited Marvin Minsky, the artificial intelligence pioneer, ‘You have to form the habit of not wanting to have been right for very long. If I still believe something after five years, I doubt it.’ I only took it in later.

Did you take part in extra-curricular activities?
I missed Freshers’ Week because I was playing chess in Australia. That formed a pattern – in 1989 I got a message in my pigeon hole, asking me to commentate on a chess match between a Grand Master and a computer. I said yes even though it ruined that week’s tutorial. But I realised that this was a watershed moment in artificial intelligence. It foreshadowed the famous Gary Kasparov match against IBM’s Deep Blue, which he lost in 1997. I also liked the pubs of north Oxford, then and since. A lot of great solutions have come out of those conversations – at pubs such as The King’s Arms and The Rose and Crown.

What came after Oxford?
A bit of me wanted to do graduate work, but I was aggressively courted by a US investment bank called Bankers’ Trust. They wanted chess players to become traders. I lasted three months before I realised I couldn’t do that all day. I moved over into asset management at a gentler operation called Duncan Lawrie, also a sponsor of chess. Throughout, I paid a lot of attention to technology and ideas, and in their own way both reflected my love of history. I used my chess winnings to invest in CISCO and ARM, when they were unknown to most. I guess that was the start of something, but I was never motivated by money. I was motivated by ideas.

And then?
Although I left Oxford I carried on talking to everyone I knew there. I was led to Allen Hill, who helped discover a cheap way to measure blood-sugar.
I was fired up by that because it had the potential to affect millions of lives for the better. The resulting company MediSense was later sold for almost $1bn. Then in 1999 I helped the chemistry department raise £20m in exchange for a venture agreement for 15 years, which allowed my company IP Group to co-invest in Oxford chemistry. After 2015 I moved to the Bahamas, and then Andorra, got married and had kids. Oxford then wanted to repeat IP Group but more broadly. I didn’t want to be involved but here I am running it!

One thing you’d change about Oxford?
If you avoid failure you avoid success. That’s a chess insight but it applies to much of life and especially venture capital at great universities. Oxford needs to think big and believe that it can change the world for the better.

Name one venture that excites you in Oxford
Oxford Nanopore. It has created the world’s first handheld DNA sequencer. That’s simply incredible and will change the world.
‘I am Elle Tait. I applied to the UNIQ Summer School during my sixth form because I wanted to be sure that a law degree was for me.

At Oxford, I was fortunate enough to be supported with a bursary during my undergraduate degree.

Most of my time as a law student was spent reading and going to tutorials but there’s so much more to get involved with, which the bursary allowed me to do.

My main passion was journalism and I became deputy editor of the student newspaper.’

If you have made a provision for any part of the University in your will, please let us know so that we have an opportunity to thank you and invite you to events of interest.

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