



NUMBER 21 2013

# Report

# King's College London

is one of the world's top 20 universities and one of the oldest in England:

a multi-faculty research-led university institution based in the heart of London.

It was the *Sunday Times* Best UK University for Graduate Employment, 2013, and was equal first for PhD completion rates.

King's has more than 25,000 students (of whom more than 10,000 are postgraduates) from more than 145 countries worldwide, and nearly 6,600 employees. It is one of the top seven UK universities for research earnings and has an annual overall income of nearly £590 million.

It offers an intellectually rigorous environment supported by welcoming and caring traditions, and is dedicated to the advancement of knowledge, learning and understanding in the service of society, both in the UK and internationally.

The King's College London annual REPORT reviews the College's work each year by featuring a sample of the research and teaching currently taking place at King's. It is the Principal's report to the College Council. This edition of the REPORT covers the year 2012-13.

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Nerve fibre bundles in the newborn brain captured by Magnetic Resonance Imaging. See 'Mapping the brain', pages 34-9.

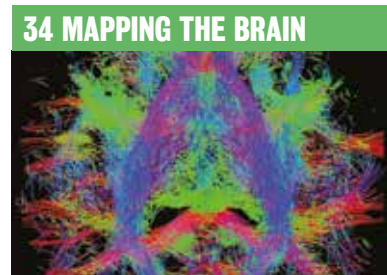
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# Celebration & innovation

The Principal and President,  
Professor Sir Rick Trainor,  
reflects on developments at  
King's in 2012-13.

After particularly fast-paced change in higher education last year, academic year 2012-13 has seen King's introducing a number of innovations to enable the College to continue to thrive in the increasingly competitive UK and international university environment.

Among the particular causes for celebration have been the two Nobel Prizes presented to alumni of King's (Professors Peter Higgs and Michael Levitt, see page 6), and the award to the College by Her Majesty the Queen of a Regius Professorship in Psychiatry to mark her Diamond Jubilee (see page 6). And, although league-tables by no means reflect the full picture of our performance, it is especially gratifying to report that the College has continued to achieve success in international tables, particularly in the *QS World University Rankings*, where King's is one of the world's top 20 universities and sixth in the UK (see page 6). King's was also joint first in the Higher Education Funding Council for England's list for PhD completion rates (see page 11).

The higher education scene changed dramatically in September 2012, with the start of major reductions in government financial support for teaching in universities and the admission by King's and most other English universities of the first undergraduates to pay fees of £9,000 a year. I am pleased to say

that undergraduate recruitment to King's since then has remained very buoyant, and we look forward with confidence to maintaining and enhancing our position in this new environment, which includes prioritising improvements in students' experience of King's.

### **Student success**

The ways in which students currently enjoy and benefit from their time here is vividly illustrated through the annual report of the President of King's College Students Union on pages 60-62, as well as by student successes such as winning the National Student Apprentice competition, which showcases the UK's top business talent and entrepreneurial ability (see page 8). Perhaps not surprisingly, King's was the *Sunday Times* Best UK University for Graduate Employment in 2013.

We are continuing to build on areas of strength to maximise our research performance and to provide our students with a world class, research-led teaching and learning environment. Developing the College's estate remains central to this aim, and the opening of our new Virginia Woolf Building on Kingsway in summer 2013 (see page 10), for example, provides high-quality accommodation and facilities for many of the academic staff and postgraduate research

students of the School of Arts & Humanities. Improving student living accommodation is also a major objective, and important activities in this respect include the ongoing redevelopment of King's College Hall to provide improved student rooms and social facilities, and our plans to develop the former Mulberry Business Park at Canada Water, London SE16, to provide 770 new student rooms and office and other premises (see page 11).

Our programme of widening participation continues to encourage students from non-traditional backgrounds to apply to university and provides enhanced financial and other support for them during their higher education. Among several projects that are contributing to this agenda this year is the establishment of the King's College London Mathematics School. Funded by the Department for Education, this will provide 60 places a year for sixth-formers with a particular aptitude for mathematics, including those with limited access to high-quality maths education elsewhere (see pages 48-53).

### **Global dimension**

The feature on pages 26-33 reports on the increasingly important global dimension of higher education. King's approach to internationalism is based on building a faculty and student body that is internationally-oriented, in particular through collaborations with university partners in other countries, and on the study of countries that will be the powerhouses of cultural, economic, political and scientific change in the 21st century.

The 100th anniversary in 2013 of the move of King's College Hospital to Denmark Hill has led us to salute the relationship between the College and the Hospital (see pages 54-59), and the way in which it has developed into the current King's Health Partners (KHP) which brings together the College and the three leading NHS Foundation Trusts in southeast London. We were delighted to hear, as *Report* went to press, that KHP has been re-accredited

*We are continuing to build on areas of strength to maximise our research performance and to provide our students with a world class, research-led teaching and learning environment.*





by the Department of Health as an Academic Health Science Centre (AHSC) for a further five years: one of only six centres to receive this status.

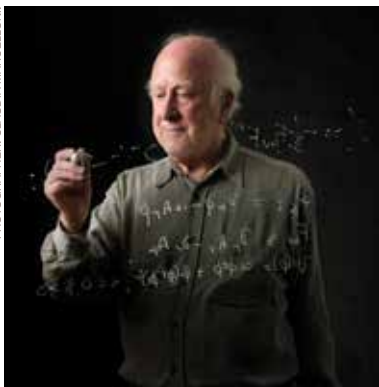
Two excellent examples of the way this pioneering collaboration brings together world-class research, teaching and clinical practice for the benefit of patients are the scientific expertise, and the interface with other disciplines, that characterise the research of the King's Dental Institute (see pages 20-25), and the work of the Centre for the Developing Brain (see pages 34-39). The Centre has received a €15 million grant from the European Research Council to further our understanding of human brain development around the time of birth and thus to reduce the number of children who suffer brain damage in this crucial period.

### **Arts and culture**

Another important and very exciting area of collaboration that has developed swiftly over the last two years is that between the College and the arts and cultural sector. The work of Cultural Institute at King's, under the leadership of Deborah Bull, in connecting the College with

practitioners, producers, policy makers and participants across arts and culture, is reviewed on pages 12-19. The advent of Science Gallery at King's reflects the fact that this cultural engagement extends across all the College's Schools of study, and this interdisciplinarity of approach is also exemplified by the breadth of King's research on food and eating, as illustrated here on pages 40-47.

World questions|KING'S *answers*, is one of the three largest fundraising campaigns to be launched by UK universities. As reported on pages 63-65, it is supporting research that addresses some of the world's most challenging problems, as well as improving the lives of students and staff at King's. The campaign was publicly launched in 2010, and I am delighted to report that, thanks to the generosity of our alumni, friends and supporters, we are now nearing our target of £500 million. Our campaign efforts will, however, continue in earnest, as there remains much still to be done in the areas of cancer; child health; neuroscience and mental health; leadership and society, and the emerging world order.



### Two new Nobels

Two alumni of King's have been awarded 2013 Nobel Prizes, meaning that 12 members of King's and its associated institutions have now received Nobels. Professor Peter Ware Higgs CH CBE FRS FRSE FKC, who was awarded the Nobel Prize for Physics with François Englert for the discovery of the mechanism of the Higgs boson, took his BSc, MSc and PhD at King's and is a fellow and honorary doctor of the College. His award highlights the remarkable tradition of discoveries in physics at King's, starting with James Clerk Maxwell in the 1860s. Professor Michael Levitt, who also received his BSc in physics at King's, was awarded the Nobel Prize for Chemistry with Martin Karplus and Arieh Warshel for the development of multiscale models for complex chemical systems.

### King's in world top 20

King's was ranked 19th equal in the world in the *QS World University Rankings* of the top 800 global higher education institutions, published in September 2013, and has retained its position as sixth in the UK for the third year running. The scores are based on academic reputation, employer reputation, academic staff to student ratio, citations per academic, proportion of international academics and proportion of international students. King's scored over 90 out of 100 for academic reputation, employer reputation, number of international students and the proportion of international academics, and again received QS five star status, meaning that it is 'world class in a broad range of areas, enjoys a high reputation and has cutting edge facilities and internationally renowned research and teaching faculty.'

### Queen awards Regius Chair

Her Majesty the Queen has awarded a Regius Professorship of Psychiatry to King's to mark her Diamond Jubilee. This Chair, which is the first to be associated with psychiatry or mental health, was awarded to the College as a reflection of the exceptionally high quality of teaching and research at King's Institute of Psychiatry (IoP), which since its foundation has led pioneering research into mental health. Its continued association with the South London and Maudsley NHS Foundation Trust enables research findings to be translated into treatment for patients at the earliest opportunity.





### Principal to move to Oxford

The Principal and President of King's, Professor Sir Rick Trainor, was appointed as the next Rector of Exeter College, Oxford, in June 2013. After 10 years of leading King's, Professor Trainor will leave the College at the end of the academic year 2013-4 and will succeed Ms Frances Cairncross CBE FRSE as Rector of Exeter on 1 October 2014. In extending his gratitude to Professor Trainor for his skill and commitment in progressing the College's interests since 2004, the Chairman of the Council of King's, the Marquess of Douro, described him as 'a highly distinguished leader of the College, under whose guidance the College's academic strengths have improved substantially.' Professor Trainor was President of Universities UK (UUK) from 2007 to 2009, and he has played a major role in promoting British higher education overseas and in improving high level US/UK university co-operation. He is Professor of Social History at King's, and in March 2013 he was elected President of the Economic History Society, the leading learned society in his speciality, economic and social history. A full tribute to Professor Trainor will be included in the next edition of *Report*.

### New Principal

Professor Edward Byrne AO has been appointed as the new Principal and President of King's from September 2014. Since 2009 Professor Byrne has been President and Vice-Chancellor of Monash University, the largest university in Australia, and from 2007 to 2009 he was Head of the Medical School and Vice Provost of University College London. A neuroscientist and clinician by background, Professor Byrne qualified in medicine at the University of Tasmania in 1974 and trained as a neurologist in Adelaide and London. He has held many prestigious clinical and research positions in Australia and the UK, as well as advisory roles for a number of charitable bodies relating to his clinical and scientific expertise.

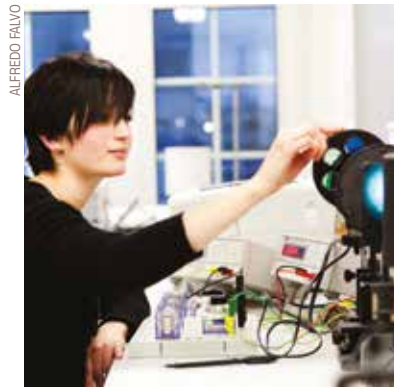
### Pope's prize for Dean

The Reverend Canon Richard Burridge, Dean of King's and Professor of Biblical Interpretation, has been presented with the 2013 Ratzinger Prize by Pope Francis. Professor Burridge is the first non-Catholic to be awarded the Prize – sometimes referred to as the 'Nobel Prize in Theology' – which was introduced in 2010 to recognise distinction in academic research relating to or expounding upon the work of Joseph Ratzinger, the former Pope Benedict XVI. Professor Burridge has also been appointed Canon Theologian and Sarum Canon at Salisbury Cathedral, while remaining Dean of King's.



### National Student Apprenticeship win

A team of King's students won the National Student Apprenticeship competition in July 2013. Aimed at helping students to develop practical skills and business acumen, the competition set contestants a number of tasks, including business-to-customer and business-to-business sales; performing 10 challenges in nine hours, and making a presentation on how the UK could increase exports from small and medium business enterprises. Edwards Slesers, Mark Chaffey, Daniela Gonzalez and Cathy So were awarded £5,000 at the final of the competition, which brings together students from all around the country to showcase the UK's top business talent and entrepreneurial ability in front of a wide range of professionals, academics and top entrepreneurs. King's was the *Sunday Times* Best UK University for Graduate Employment in 2013.

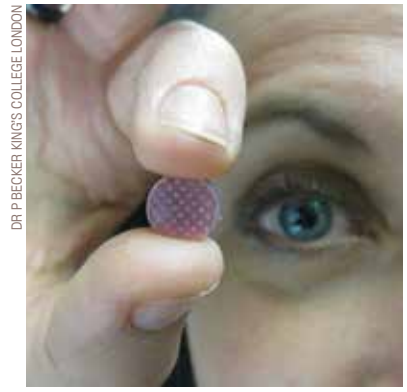


### Athena SWAN Bronze Award

King's commitment to gender equality in science disciplines has been recognised by the Athena SWAN Charter with the successful renewal of its Bronze Award. The Charter recognises commitment to gender equality in science, technology, engineering, mathematics and medicine. King's has been a member of the Athena SWAN Charter since 2007 and first gained a Bronze institutional award in 2008.

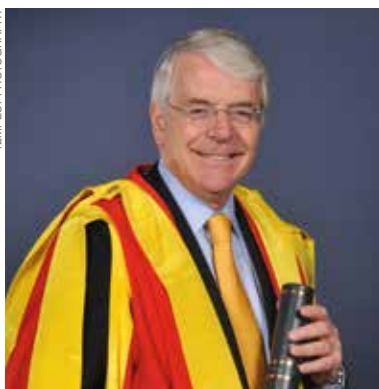
### WISE award

Elizabeth Kuipers, Professor of Clinical Psychology at King's Institute of Psychiatry (IoP), was presented by HRH The Princess Royal with the Women in Science and Engineering (WISE) Lifetime Achievement award in November 2013, for her significant contribution to science, industry and society as a whole and for inspiring other women to follow in her footsteps. The WISE Awards are presented to organisations and individuals promoting science, technology, engineering and mathematics to girls and young women.



### Injection-free vaccination

Scientists at King's have demonstrated the ability to deliver a dried live vaccine to the skin without a traditional needle, and shown for the first time that this technique is powerful enough to enable specialised immune cells in the skin to kick-start the immunising properties of the vaccine. A pain-free microneedle array – a tiny disc with several micro-needles made of sugar, which dissolve when inserted into the skin – offers a cheaper alternative to hypodermic needles, minimises the safety risks from needle contamination and removes the need for refrigeration of vaccines. It could help to prevent or treat diseases including HIV, malaria and diabetes.



### Honorary doctorates

Honorary doctorates of King's were awarded to seven highly distinguished people in 2013. The first was bestowed on Nobel Prize-winning geneticist Sir Paul Nurse, President of the Royal Society, in January, and in November former Prime Minister the Rt Hon Sir John Major KG CH (*above*) was one of six recipients at a special ceremony in the College Chapel. The others were Professor Garret A Fitzgerald FRS, Director of the Institute for Translational Medicine and Therapeutics at the University of Pennsylvania; Professor Tom Kibble CBE FRS, Emeritus Professor of Theoretical Physics at Imperial College London; Professor Dame Hermione Lee FBA FRSL, biographer, literary critic and President of Wolfson College, Oxford; Dr Susan Resnick, Chief of the Laboratory of Behavioral Neuroscience and the Brain Aging and Behavior section of the National Institute on Aging in the USA, and Professor John Sexton, President of New York University. Sir John Major is Chairman of the College's World questions|KING's *answers* fundraising campaign board.

### First pre-eclampsia test

The lives of hundreds of babies a year in the UK could be saved thanks to a new rapid blood test for pre-eclampsia. Researchers at King's and at Guy's and St Thomas' NHS Foundation Trust have found that testing the level of a protein called placental growth factor (PIGF) in pregnant women before 35 weeks can accurately diagnose this type of high blood pressure in pregnancy, which leads to some 1,000 baby deaths each year in this country. The PIGF blood test gives an accurate result in just 15 minutes and identifies 96 per cent of women who will need to be delivered within the next 14 days.

### Honours

Among King's staff and alumni recognised in the 2013 New Year's Honours list was Professor Simon Wessely from King's Institute of Psychiatry (IoP), (*above*) who was awarded a knighthood for services to military healthcare and psychological medicine. The citation described how Professor Wessely had 'dramatically improved mental health services for the Armed Forces.' Sarah Cowley, Visiting Professor of Community Practice Development at the National Nursing Research Unit at King's, received a DBE for services to health visiting; Professor Janet Treasure, Director of the Eating Disorders Unit at the IoP, received an OBE for services to people with eating disorders; David Clark, Visiting Professor at the IoP, was awarded a CBE for services to mental health, and Dr Lisa Appignanesi, Visiting Professor in the Department of English, received an OBE for services to literature.





DAVID TETT PHOTOGRAPHY



MICHAEL DONALD



PHIL SAYER

### **New appointments**

Professor Evelyn Welch (*above*) joined King's as Vice-Principal (Arts & Sciences) and Professor of Renaissance Studies from January 2013, and Professor Karen O'Brien became Vice-Principal (Education) and Professor of English Literature in April 2013. Professor Welch was formerly Vice-Principal for Research and International Affairs at Queen Mary, University of London. Professor O'Brien came to King's from the University of Birmingham where she was Pro-Vice Chancellor (Education). Professor David Caron, who became Dean of The Dickson Poon School of Law at King's in summer 2013, was previously the C William Maxeiner Distinguished Professor of Law at the University of California, Berkeley.

### **Tutu visits King's**

The Most Reverend Desmond Tutu, former Archbishop of South Africa and Nobel Peace Laureate, and his wife Leah, visited King's in November 2013 to mark the refurbishment and new use of Tutu's, the former Student Union nightclub space at the Strand Campus. Desmond Tutu took his bachelor's and master's degrees in theology at King's in the 1960s, and has been a frequent visitor to King's ever since, including as the College's first Visiting Professor in Post-Conflict Societies in 2004.

### **Tagore Centre for Global Thought**

The Tagore Centre for Global Thought was officially inaugurated at King's in April 2013. Housed in the prestigious King's India Institute, the Tagore Centre has been established to engage audiences with India's intellectual traditions whilst addressing a number of contemporary global questions and dilemmas. It was founded in partnership with the Ministry of Culture, Government of India, as part of celebrations to mark the 150th anniversary of the birth of Rabindranath Tagore (1861-1941): the Bengali poet, writer and musician who became the first non-European to win the Nobel Prize for Literature 100 years ago in 1913.

### **Virginia Woolf Building opens**

The College's new Virginia Woolf Building on Kingsway opened during the summer of 2013, providing accommodation and facilities for many of the academic staff and postgraduate research students of the School of Arts & Humanities. The building, which is part of the Strand Campus, is named after the writer, novelist and critic Virginia Woolf (then Virginia Stephen), who was a student at the King's Ladies' Department in Kensington from 1897 to 1902, where she took classes in Greek, Latin, German and history. Her sister Vanessa (later the artist Vanessa Bell) also attended the College, as did their father, the writer and biographer Sir Leslie Stephen.



### Canada Water development

King's is to develop the former Mulberry Business Park at Canada Water, London SE16, to provide 770 new student rooms, office space, affordable housing, retail units, a health care centre and landscaped public space. Work at the site (two Underground stops from the College's Guy's Campus at London Bridge and four stops from the Waterloo Campus) will start in 2014, with completion planned for 2016. The new development, which has been approved by the Mayor of London and the London Borough of Southwark, will help the College to meet current and future demand for high-quality student accommodation and make a positive economic, educational and cultural contribution to the local community. The long-term aspiration is to develop a university environment at Mulberry and the adjacent Harmsworth Quays site, as part of Southwark's plan to create a new town centre at Canada Water.



### Shakespeare400

As co-ordinator of Shakespeare400, a consortium of some of the UK's leading cultural, creative and educational institutions, King's will lead the celebrations in 2016 marking the 400th anniversary of Shakespeare's death. A series of public performances, programmes, exhibitions and creative activities in the capital and beyond will emphasise the pivotal role of London in the public understanding of the works of Shakespeare. In 1916, Professor Sir Israel Gollancz of King's led the Shakespeare tercentenary celebrations.



### Equal top for PhD completion

King's is one of the country's two top universities for PhD completion rates, according to data released by the Higher Education Funding Council for England in August 2013. Nearly 87 per cent of the College's full-time research degree starters have qualified with a research degree within seven years, compared with a national average in England of 72.9 per cent. The results reflect the quality of both the supervision, monitoring and feedback given to King's doctoral candidates and the College's admissions and selection processes for research degrees.

### FBA for Beaton

Roderick Beaton, Korae Professor of Modern Greek & Byzantine History, Language & Literature at King's, has been elected a Fellow of the British Academy. His research spans Greek literature, history, and culture from the 12th century to the present; classical reception in the formation of late medieval and modern Greek identity, and the Greek novel since antiquity. The Korae Chair, founded at King's in 1918, is one of only two established professorships in Modern Greek at a British university.



Glass sculptures by Shelley James formed part of **Photo 51: from DNA to the Brain**, exploring the famous X-ray diffraction image, taken 60 years ago by Dr Rosalind Franklin of King's, which showed the double helix structure of the DNA molecule.



# Academia art?

King's has embarked on a bold  
and unique collaboration between  
the arts and academia



**F**ive minutes' walk from Deborah Bull's office in Somerset House will take you to some of the world's most famous arts venues, including the National Gallery, the National Theatre, the Southbank Centre, and Ms Bull's former home in Covent Garden, where she danced with The Royal Ballet before becoming Creative Director of the Royal Opera House from 2008.

Now, as Director of Cultural Partnerships for King's, she provides leadership for the College's cultural ambitions, enriching and extending its partnerships and collaborations

across the creative and cultural sectors. In this role, she has already established Cultural Institute at King's, with its home on the Strand Campus, and she is leading on the development of Science Gallery at King's, part of the Global Science Gallery Network of eight Science Gallery locations to be developed in partnership with leading universities in urban centres worldwide by 2020. As Director, Cultural Partnerships, she is providing strong leadership, clear strategic direction and developing effective teams to build on this unequalled advantage to fulfil the College's cultural

The **Innovation programme** provides a bridge between the College's research and the creative and cultural sectors, so that new knowledge and expertise developed through academic research can realise its full potential and impact. For example, a collaboration with the Imperial War Museum pairs War Studies specialists and historians from King's with curators from the Museum, supporting the development of a collecting policy for items from the post-1945 era.



Three new prototypes which allow audiences to engage in new ways with artworks and museum objects emerged out of Cultural Institute's **Arts & Digital Creative Labs** held this year:

- **CultureMe** posts personalised cultural artefacts on to Facebook users' walls, based upon their status updates. 'I'm hoping to bring randomness, tangential irrelevance and inspiration back to the daily commute,' explained Paul Vetch, from the King's Department of Digital Humanities, who worked with the *London Review of Books* in developing the app.

- The **'haptic' robotic glove**, developed by academics from the King's departments of Informatics, Management and War Studies with colleagues from the Crafts Council, allows the wearer to virtually 'touch' precious objects that are usually locked away in museums and galleries.

- **InkVisible** (above) allows audiences to engage directly with artworks and sculpture. It aims to challenge perceptions of the meaning and value of art by permitting people to 'graffiti' over artworks using laser pens and kinetic tracing software. InkVisible was developed by Dr Gretchen Larsen from King's Department of Management, together with Birmingham Museums & Art Gallery and creative technologist Nikki Pugh.

Cultural Institute is continuing to work with each of the project teams to further develop the prototypes and encourage their uptake and use across the museum and gallery sector.

ambitions, taking this engagement to a new level that is unique for academia.

### On the edge

‘For some time, universities have been aware of the need to engage the public with what they do, and there is now a growing awareness of the potential of *cultural* engagement,’ she says. ‘I think what is unusual at King’s is that rather than taking someone from within the College and asking them to face outwards, King’s has brought in someone from the outside who is very clearly identified with the

cultural sector, and with a track record in the arts, to work across the College to provide leadership for its cultural ambitions. In a sense, that positions me on the edge, on the perimeter between the cultural sector – including the public – and the College. I feel as if my role is to stand there like some sort of a colossus, trying to bring them all together.’

The College’s recently-approved strategy for culture at King’s provides a structure for exploiting potential synergies and mutual benefits between academia and the arts. While Science Gallery at

King’s will focus on collaborations between art and science, Cultural Institute at King’s connects the College with practitioners, producers, policy makers and participants across arts and culture, creating space where conventions are challenged and original perspectives emerge.

### Strategic aims

‘The Institute has four over-arching strategic aims,’ Ms Bull explains. ‘First, we’re providing a neutral space and analytical rigour to support the cultural sector in addressing common questions and

JANA CHELLINO



### Presenting Practice

The changing environment – in particular, technological and social shifts – is causing arts practice to change, too, with emerging, hybrid art forms suggesting new relationships between artists and audiences and the lines between creator and observer becoming increasingly blurred. Through its **Presenting Practice** programme, the Institute is creating new forms of collaboration and engagement that explore and exploit these developments, drawing around 35,000 people into projects at King’s this year such as this art installation (*above*) recreating part of the former Plant Science Department of King’s.



### In the Beginning was the End

– a co-production between the Institute, Somerset House and dreamthinkspeak, directed by Tristan Sharps – led participants on a surreal fictional journey (*above*) through the usually unseen vaults, cellars and vast underground spaces below the College and Somerset House. Makers and builders collaborated with engineers, 3D video practitioners, electronic hackers and lab technicians from the College’s Physics Department, interweaving a range of technologies into the production and creating a powerful story which attracted audiences of some 20,000, and generated excellent reviews.



shared concerns, through cultural enquiry. Second, we're facilitating collaborations between academics, arts organisations, cultural producers and policy makers, in order to achieve productive knowledge exchange and drive innovation. Third, we're engaging artists, academics and a broader public as partners in artistic practice, recognising that every act of creation is an act of research, and the public – and their response – is part of that process. And lastly, we're acting as a broker for collaborative research, teaching

and learning opportunities, ensuring that students and academics have access to the very best artistic and cultural practice.' Four strategic programmes flow from those aims: Cultural Enquiry; Innovation; Presenting Practice; and Collaborative Teaching, Research and Learning.

#### **Beyond anecdote**

As Ms Bull points out, in the UK's current socio-economic and intellectual environment, there is a pressing need for cultural organisations to understand and

articulate their role and purpose. 'The cultural sector needs the analytical tools, the research expertise and the networks that an academic institution like King's can provide, in order to move beyond anecdote to provide compelling evidence of the role that culture can play in tackling key social and individual concerns,' she says. 'With its wealth of research expertise, its history, and its location at the heart of what is arguably the world's arts capital, King's is ideally placed to play a central role in this.'

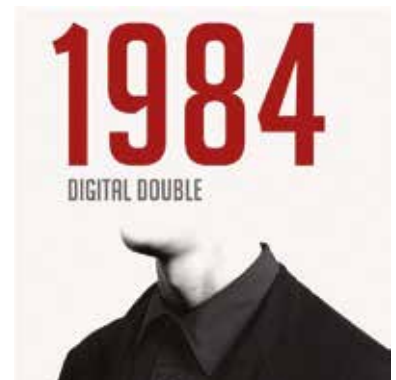
**The Joy of Influence** reflected the belief of its curator, the novelist and essayist Andrew O'Hagan, who is Professor of Creative Writing at King's, that every novelist has what he describes as their 'shadow art, the one that isn't ours, the one we might covet, feeling it knows something about us.' This highly successful series of talks produced by Cultural Institute and curated by Professor O'Hagan brought six of the English-speaking world's most celebrated novelists (Kazuo Ishiguro, Colm Tóibín, Alan Warner, Lavinia Greenlaw, Sarah Hall and John Lanchester) to King's, each to discuss a different great art form that is close to their heart.



MICHAEL DONALD

Kazuo Ishiguro with Professor Andrew O'Hagan.

**Digital Double** is a recent project with Headlong, a theatre company that has transformed George Orwell's *Nineteen Eighty-Four* for the stage. King's academics including Dr Btihaj Ajana (Digital Humanities) and Professor Alex Callinicos (European & International Studies) have been collaborating with the creative team to explore the relationship between the systems of surveillance described in Orwell's novel and the operation of surveillance in contemporary Britain to ask 'how is Big Brother watching us now?', with a mobile app, (see [www.kcl.ac.uk/cultural/culturalinstitute/showcase/current/pp/knowledgeproducers/1984-App-Project-Explore-Your-Digital-Double.aspx](http://www.kcl.ac.uk/cultural/culturalinstitute/showcase/current/pp/knowledgeproducers/1984-App-Project-Explore-Your-Digital-Double.aspx)) that creates a data double – a digital identity – for each user.



### Key role

But, she emphasises, 'At the same time, arts and culture also have a key role to play at King's – in enhancing the student experience, demonstrating academic impact, engaging a wider public, widening participation, building the College's reputation and driving innovation.' In its first year of operation, Cultural Institute's programmes of activity engaged 124 academics and 221 students from across the College, 183 artists and cultural organisations, and 47,217 audience members, while the Institute

brokered 15 internships in the cultural sector.

Innovation is key to her strategy. 'Arts and culture inspire new ways of thinking and drive innovation because artistic practice is, by its very nature, interdisciplinary. It's at the boundaries between disciplines that innovation is most likely to occur. Artists share the characteristics of great innovators: they are acute observers of human behaviour; they unite the head and the hand; they experiment with instinctive knowledge; they seek ways to subvert habitual responses;

they are passionate and driven; and they see the world not as it is, but as it could be. All this can be of huge benefit to King's.'

### What the future looks like

This will undoubtedly involve taking the College into places that are outside its comfort zone. 'Until now, King's has perhaps tended to partner with organisations that look like itself – building-based, historic, something royal in the title, several hundred years of history. But actually, if you want to think about the future, you might want to look

JANA CHIELLINO



### Photo 51: from DNA to the Brain

explored the famous X-ray diffraction image, taken 60 years ago by Dr Rosalind Franklin of King's, which provided the crucial piece of the jigsaw for the discovery of the double helix structure of the DNA molecule. This exhibition, sited just metres from where Franklin's photo was captured in the early 1950s, showcased installations by artist Christine Donnier-Valentin, photographs by Marcus Lyon, and glass sculptures by Shelley James, which were born out of collaboration with archivists, neuroscientists and X-ray crystallographers at King's. Lectures, workshops and a highly successful family day (*below*) examined not only the historic moment but also the impact of the discovery of DNA on contemporary neuroscience and its potential to pioneer new ground in biomedicine.

JANA CHIELLINO



JANA CHIELLINO



at organisations that look a bit *like* the future: that's to say, non-building-based, flexible, itinerant and very, very small. We're broadening the palette from which King's academics can identify potential partners, introducing them to artists and arts organisations that we think are doing interesting work, or heading off in new and innovative directions.'

### Interface

As someone who has always worked at the interface between the present and the future, Ms Bull knows how important it is to be passionate and

committed, to be an advocate and to be very clear. 'You have to be comfortable about flying in the face of convention from time to time, or leading people to a place they may not understand,' she says. 'That's the world I've operated in, and I'm comfortable in it.'

'The thing about working in this area of experiment is that you can't assume everything will succeed. At the Royal Opera House I would happily say to the Board, "If a percentage of what I'm doing doesn't fail, then I'm failing";' she explains. 'It's not the kind of language an executive would usually

employ with her Board, but it's clear to me that you cannot genuinely experiment and expect always to succeed. We can be too negative about failing – failing is a way of learning. We should acknowledge that and celebrate it. I'm fond of quoting Samuel Beckett on this: "Ever tried. Ever failed. No matter. Try again. Fail again. Fail better".'

### Space for bold things

When Ms Bull engaged with King's she anticipated that the College would be familiar with this level of risk – perhaps because scientific and other forms of research also require

As part of **King's Cultural Challenge**, 12 King's students pitched their brand-new responses to urgent, real-world questions in a competition to win internships at the V&A, Southbank Centre, Royal Opera House and the Royal Shakespeare Company. Among the winners was Kate McEneaney whose response to the 'I hate Shakespeare!' challenge set by the RSC was *'The Dark Bard Rises'* programme for 16-25 year olds. This aims to engage young fans of franchises such as *Twilight* and *The Hunger Games* by highlighting the darkest themes of Shakespeare through live performances of *Hamlet* and *Macbeth* in the style of a 'flash mob.' For the V&A, Stella Toonen pitched *'Designing the Future City'*, which challenges visitors to think about their urban environment and the ways they interact with it, through an underground gallery.



### Cultural Enquiry

In August 2013, one year on from the London Olympics, Cultural Institute at King's launched its first cultural enquiry, testing the case for a co-ordinated approach to the integration of culture and the arts within major sporting events. The power of culture to add value to what was an extraordinary sporting occasion was widely acknowledged, from the one billion viewers worldwide who watched Danny Boyle's opening ceremony for the Games to the 43 million who took

part in Cultural Olympiad programmes in their local communities around the country. Through this Enquiry, Cultural Institute hoped to capture the expertise that was developed over the five years of planning and delivering this cultural programme, and after hearing evidence and reviewing existing research, the Enquiry recently published its findings and recommendations. *Beyond Performance: A Cultural Enquiry into major events and culture* can be found online at [www.kcl.ac.uk/cultural/culturalinstitute/showcase/current/ce/MajorEvents.aspx](http://www.kcl.ac.uk/cultural/culturalinstitute/showcase/current/ce/MajorEvents.aspx)



experimentation and wrong turnings in order to progress. And to date, that has been the case. ‘My experience has been that King’s has initiated, supported and embraced this, and we’ve had a huge number of academics engaging with us, with strong support from the Schools and departments and the College leadership. I think King’s is up for the challenge, and is creating space for bold things to happen.’

At the same time, she accepts that she and her team need to show, demonstrate and illustrate what can be done. ‘When you’re setting up something new you need to do

things which signify the change you want to see. Especially if you’re attempting something that is relatively complex or new, you need to be able to point to the event or the project, and say “this is what it means”.’ The last year or so has therefore seen some exciting art and cultural events, projects and activities at King’s, delivering against the four strategic aims.

#### National role

Looking ahead, Ms Bull is intrigued by the potential for King’s to play a role nationally in this area. ‘We really are in a unique place to build

a national role in academic-arts partnership,’ she says. ‘I think the experience of developing these broader partnerships will be interesting for the College in helping to shape its national agenda. We’ll therefore be looking to build on existing partnerships outside London, and on the interest that’s being expressed by people in other parts of the country in what we’re doing. It’s important to remember that although we have strong local presence and international connections, King’s is also part of the UK – and paid for by the UK tax-payer.’

DAVID TETT



**Deborah Bull** danced with The Royal Ballet from 1981 to 2001, rising through the ranks to become Principal Dancer and performing an extensive range of roles, from *Swan Lake* and *Sleeping Beauty* to innovative new works. In 2001 she joined the Royal Opera House Executive to devise and implement strategies for developing new art, new artists and new audiences, becoming Creative Director in 2008, and she took the lead on the Royal Opera House’s 2012 Olympic programming.

Her work for television and radio over the last 15 years has included the award-winning *The Dancer’s Body* and programmes on topics as diverse as the law and ageing. She writes and speaks on the arts across a range of media and is author of four books including Faber’s *Pocket Guide to Ballet* (2005) and *The Everyday Dancer* (2011). She has served on Arts Council England, as a Governor of the South Bank and the BBC and as a judge for the 2010 Man Booker Prize. In 1999 she was awarded a CBE for her contribution to the arts. She joined King’s in March 2012, and in September 2013 she was appointed a member of the Council of the Arts and Humanities Research Council (AHRC).

INGRID RASMUSSEN



At King’s Ms Bull is also leading the College’s plans to develop Science Gallery at King’s, on the College’s Guy’s Campus at London Bridge. This innovative venue for science and art collaboration, close to the Shard, has won capital funding awards of £7 million from the Wellcome Trust and Guy’s and St Thomas’ Charity and is scheduled to open in 2015, with a mission to ‘ignite creativity and discovery where science and art collide.’ The Gallery will generate and host dynamic exhibitions, events, performances and festivals, bringing science, technology and health into dialogue with the arts and design in an unprecedented way, inspiring new thinking and driving innovation. It will be free to visit, and expects to attract some 250,000 visitors a year, with a focus on 15-25 year olds. The Director is Dr Daniel Glaser, previously Head of Special Projects in Public Engagement at Wellcome Trust.





# Everything from the neck up

The work of King's Dental Institute  
embraces all aspects of science.



‘Generally, people think of dentistry as drilling holes and filling them up again. But the reality is that there’s an incredible richness and breadth to the science that we’re engaged in’ ...

explains Professor Dianne Rekow, Dean of the Dental Institute (*above*) at King’s. ‘And this broad-ranging science is not only a vital part of the education we provide for our students, but is also crucial to the Institute’s research enterprise. It’s true to say that our dentists are now engaged with everything from the neck up.’

King’s Dental Institute defines its vision in broad terms as ‘to understand disease, enhance health and restore function’, and it is not hard to find examples of the wide-ranging, in-depth scientific expertise and knowledge, and the interface with other disciplines, that enable the Institute’s dental researchers and practitioners to fulfil that far-reaching aim.

For example, the use of injectable ‘scaffolds’ that can carry stem cells to rebuild missing bone and other tissue is a field in which maxillo-facial surgeons and material scientists are leading the way, incorporating aspects of engineering,

chemistry, biology and medicine. The general medical significance of oral health is becoming increasingly clear; and not only do many diseases have oral implications, but also it is now evident that some diseases can be diagnosed first from the way they manifest themselves in the mouth. Moreover, there is a high correlation between inflammatory conditions in the mouth and conditions including diabetes, cardiovascular disease, low birth-weight babies, and perhaps dementia.

### Biomarkers

Saliva contains biomarkers which may ultimately make it a more effective source for diagnosing disease than blood and urine. Oral cancers are the dentist’s domain, but dentists need to be able to understand and analyse the way in which they are intimately connected with cancers elsewhere in the body.

One of the examples cited by Professor Rekow of this scientific

breadth and depth is the team that is developing a means to replace missing teeth with new bioengineered teeth generated from a person’s own gum cells. As described in the *Journal of Dental Research* in March 2013, the team, led by Professor Paul Sharpe, has isolated adult human gum (gingival) tissue from patients and grown more of it in the lab, and then combined it with the mesenchyme cells of mice. ‘When this combination is transplanted into the mice,’ Professor Rekow explains, ‘they are able to grow natural teeth containing dentine and enamel, as well as viable roots and crowns with nearly natural anatomy. Soon the team hopes to identify a way of creating these conditions with all-human tissues, in humans.’

Another fascinating piece of science, emerging from the same area of regenerative research, is evidence that confirms the theory of how biological patterns such as tiger stripes are formed, first proposed by

CHAD LITTLEJOHN



King’s research has confirmed the theory of how biological patterns such as tiger stripes are formed, first proposed by British mathematician and code-breaker Alan Turing in the 1950s.

*'to understand disease,  
enhance health and  
restore function'*

the great British mathematician and code-breaker Alan Turing in the 1950s. 'Regularly-spaced structures, from vertebrae and hair follicles to the stripes on a tiger or zebrafish, are a fundamental motif in biology,' Professor Rekow points out. 'Our study of the ridges found in the roof of the mouth in mice has now provided the first experimental identification of an activator-inhibitor system at work in the generation of stripes.' Professor Jeremy Green's research, funded by the Medical Research Council and published online in *Nature Genetics* in 2012, not only demonstrates a mechanism that's likely to be widely relevant in vertebrate development, but also suggests that the chemicals involved, called morphogens, can be used in regenerative medicine to differentiate stem cells into tissue.

Both these examples are from the Institute's Craniofacial Development & Stem Cell Biology Division. Having grown steadily since it was set up in 1994, this Division now consists of 16 principal investigators managing a research team of over 100: a size which, Professor Rekow says, works in its favour by creating a critical mass of research-active staff, with an effective balance across the spectrum of junior to senior investigators. This reflects the

general scale of the King's Dental Institute, which is the largest dental school in the UK and one of the largest in Europe, with over 270 academic and research staff; nearly 800 undergraduate students; some 365 postgraduates on taught courses and over 100 postgraduate research students. 'We're big enough to have the breadth and diversity in the science and the critical mass to create the synergies that are crucial for research excellence,' Professor Rekow says.

### Novel strategies

A further example of the breadth and depth of the science that is characteristic of the Institute comes from its Biomaterials, Biomimetics & Biophotonics Division, where the focus is on developing novel strategies to repair, regenerate and image damaged or diseased tissue. In particular, the group brings together researchers in materials, stem cell and diagnostic imaging, using the mouth as a useful, easily accessible, testing environment for new materials and techniques. Professor Rekow is particularly excited by their biophotonics work, which involves using imaging to study biological molecules, cells and tissue. By focusing coherent light via the distal end of an endoscope equipped with a special confocal



Biophotonics researchers can use the mouth as an easily accessible testing environment for new materials and techniques.



A King's team is developing a means to replace missing teeth with new bioengineered teeth generated from a person's own gum cells.



optical unit, this technique provides an instant, non-invasive means of diagnosing cancerous tissue and pinpointing it during surgery.

‘It’s amazing to be able to see blood cells in the vessels in real time, non-invasively, and without using any ionising radiation,’ she says. ‘And if there is cancer developing you can spot the changes in the way the vessels develop, so that you can identify pathologies. Then, during surgery, the surgeon can also see exactly where and how much tissue to incise. Our researchers and practitioners use this technology for looking mainly in and near the mouth, but with the endoscope you could in fact look almost anywhere in the body – at ulcers in the stomach, for example, or wherever an endoscope can reach. So the application and the breadth is really exciting.’

### Impact beyond dentistry

Investigations in the Institute’s Mucosal & Salivary Research Division also encompass basic and applied research, involving collaboration with colleagues in other parts of the Institute and the College and with external partners, and outcomes that impact beyond dentistry and have implications for medicine much more widely.

Indeed, many of the staff in this group are clinically qualified, with medical training and other expertise such as in dermatology.

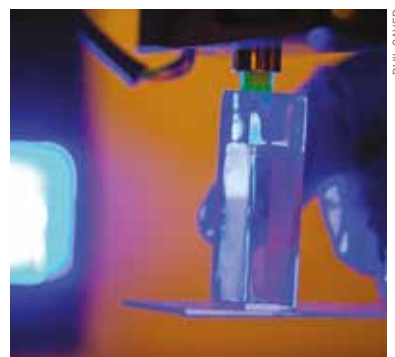
‘Saliva is a natural cocktail of nucleic acids, proteins, growth factors, hormones and bacteria, and investigating these has enabled us to understand the way in which it regulates and maintains the health of the mouth,’ explains Professor Rekow. ‘It also has wide-ranging roles in speech, swallowing, taste, digestion and immunity, as well as in helping teeth to stay healthy. Moreover, the fact that it’s much easier to collect saliva samples than those of blood or urine makes it an attractive tool for basic research, point-of-care systems, diagnostic biomarkers, mass screening for whole body disease and clinical monitoring.’

‘In particular, exploring saliva’s role in the detection of systemic disease is an important part of our research portfolio. As a result of input from King’s, the national UK Biobank incorporated saliva as the third diagnostic fluid, alongside blood and urine, and has collected saliva samples from some 120,000 people across the country. These samples have been stored in a central liquid nitrogen facility at UK Biobank and will be available to the research community for

*‘As a result of input from King’s, the national UK Biobank incorporated saliva as the third diagnostic fluid, alongside blood and urine’*



GREG FUNNELL



PHIL SAYER

Because saliva samples are much easier to collect than blood or urine, it is an attractive tool for mass screening for whole body disease and clinical monitoring.

studying a wide range of diseases.’

The Institute’s Division of Population & Patient Health also uses a wide range of research methods, from epidemiology to focus groups, and works closely with clinicians, educationalists, social and behavioural scientists and statisticians. Its research includes evaluating the organisation and delivery of oral health care services; modelling the dental workforce for career patterns, training needs and recruitment, and the motivation and skill-mix in this area, as well as the promotion of oral health and wellbeing. This group’s research is concerned with how social factors such as education, social status, poverty, and belief systems influence both oral and mental health.

‘One of our important contributions in this area is in the field of dental anxiety,’ Professor Rekow explains. ‘There are some people who are “deathly afraid” of dentists, often avoiding any treatment until their pain becomes intolerable – and then they can only be treated under general anaesthesia. In 2008 King’s launched the UK’s first Health Psychology Service to provide support for people who are very anxious about visiting the dentist. Using cognitive behavioural therapy

(CBT), our investigators have been able to eliminate the need for general anaesthesia for these patients. Three special training sessions can avoid the need for a general anaesthetic for patients who need an injection, and five such sessions can be enough to enable a patient to receive routine dental care.’

The Institute’s research has a global emphasis, and one of its most important contributions internationally is the Senior Dental Leaders Programme: a high-powered, annual six-day conference designed to equip senior oral health leaders worldwide with the strategic leadership and management skills they need. First conceptualised in 2007 by Professor Raman Bedi, Head of King’s Centre for International Child Oral Health, this intensive event is run in partnership with Harvard School of Dental Medicine and sponsored by Henry Schein Inc and Colgate-Palmolive.

#### International network

‘The aim is to create an international network of leaders to foster collaboration, knowledge exchange and mutual support in solving the complex oral health challenges in their countries, and to improve the state of oral health at the local, state, and federal levels.’

explains Professor Rekow, who at the most recent conference, at Harvard in April 2013, addressed the conference on the topic of women in dentistry and leadership issues. ‘More than 100 dental leaders have benefited from this programme over the past seven years, and it continues to grow from strength to strength, helping to promote a cavity-free world.

‘To sum up – we make a difference. Our Dental Innovation and Translation Centre enables discoveries to be transformed into advances in patient care, health care policy and new products – all aimed at improving health. Our particular focus on “everything from the neck up” informs international understanding of disease and health in general and influences the health of the whole body.’

*‘We’re big enough to have the breadth and diversity in the science and the critical mass to create the synergies that are crucial for research excellence’*

PHIL SAYER





# The new internationalism

King's approach to internationalism is based on collaborations with partners with a shared ethos and similar aims; on building a faculty and student body that is internationally-oriented, and on the study of countries that will be the power houses of cultural, economic, political and scientific change in the 21st century.





King's ranking among the world's top 20 universities (QS, September 2013) and its position in the heart of London, arguably the world's leading capital city, make it a highly attractive destination for international students and staff.

'The number of international students here has doubled since 2004,' points out the Principal, Professor Rick Trainor. 'Almost one in three of the College's students are now from overseas, and we have almost 30,000 overseas alumni from 180 countries, who have



### King's alumni groups

01: Angola	37: Kuwait
02: Argentina	38: Luxembourg
03: Australia NSW	39: Malaysia
04: Australia QLD	40: Mauritius
05: Bahamas	41: Mexico
06: Bangladesh	42: Netherlands
07: Belgium	43: New Zealand
08: Brazil	44: Nigeria
09: Brunei	45: Norway
10: Canada	46: Pakistan
11: Chile	47: Peru
12: China Beijing	48: Portugal
13: China Shanghai	49: Qatar
14: Croatia	50: Romania
15: Cyprus	51: Saudi Arabia
16: Denmark	52: Singapore
17: Dominican Republic	53: Slovakia
18: Egypt	54: South Africa
19: France	55: South Korea
20: Germany Berlin	56: Spain
21: Germany Bonn	57: Switzerland
22: Germany Munich	58: Syria
23: Grand Cayman	59: Taiwan
24: Greece	60: Thailand
25: Hong Kong	61: Turkey
26: Hungary	62: UAE
27: India Delhi	63: USA Boston Area
28: India Mumbai	64: USA Chicago
29: Indonesia	65: USA New York Tri-State
30: Iran	66: USA Philadelphia
31: Ireland	67: USA San Francisco
32: Israel	68: USA Southern California
33: Italy Milan	69: USA Southern Tri-state
34: Italy Rome	70: USA Washington DC Area
35: Japan	71: Vietnam
36: Kenya	

### Research sans frontières

Research that crosses international boundaries, that is funded by international bodies and involves major collaborations with overseas partners, is becoming increasingly common for King's academics.

### Autism Interventions

For example, European Autism Interventions – A Multicentre Study for Developing New Medications (EU-AIMS), led by Professor Declan Murphy of King's Institute of Psychiatry (IoP) and Roche Neurosciences, is receiving €30 million (the world's largest single grant for autism research) from the European Commission to enable drug companies from the

European Federation of Pharmaceutical Industry Associations and scientists from 14 European centres of excellence to find new methods for the development of drugs for autism spectrum disorder.

### Social dance

A £1.79 million grant from the European Research Council (ERC) will enable Professor Ananya Jahanara Kabir of the Department of English (*right*) to investigate the use of social dance to understand dialogues across postcolonial worlds separated by linguistic barriers, to explore cultural contact between African and Indian heritage populations in sugar plantation colonies and to trace Lusophone links between Goa, Mozambique, Angola and Brazil.

contributed enormously to King's and its associated institutions, including as generous donors to the College's work.' King's also has more than 1,700 international academics and researchers from over 80 different countries, forming some 40 per cent of its academic staff body.

The College has, however, been a relative latecomer among UK universities in international strategy terms, especially when compared with those that established campuses and offices overseas several decades ago.

### Distinctive features

'Our position as a late starter has enabled us to assess the pros and cons of what other universities have done,' points out Professor Keith Hoggart, Vice-Principal (International) up to September 2013. 'It meant that from the outset we could impose discipline on our actions that secured real advantages for us, and gave us opportunities to heighten commitments to the College's fundamental values, while also allowing distinctive features of the institution to be promoted and amplified.'

In Professor Keith Hoggart's experience, UK universities' internationalisation can be seen by many countries as being primarily focused on student recruitment. 'They dislike the fact that when you look behind the International Office door in many UK universities, most of what you find is the recruitment team,' he points out. He also warns about inequalities in some UK universities' overseas campuses. 'These have been heralded as beacons of home quality in a foreign land. However, for some cases, whereas perhaps 10 per cent of their

TOM CAMPBELL



TERRA-I



### Cardiovascular

Another ERC grant of £1.28 million is enabling Dr Alberto Figueroa, Senior Lecturer in Computational Modelling, to work towards personalising cardiovascular medicine by developing an image-based computer modelling framework for subject-specific cardiovascular simulation.

### Nanomaterials

The EU-funded BONAS project, led for King's by Professor Anatoly Zayats of the Department of Physics (see *Report 19*, 2011) has brought together King's specialists in nanomaterials with colleagues from across Europe to develop state-of-the-art sensors capable of detecting hidden explosives.

More recently, Professor Zayats has received a grant of £1.78 million from the ERC to investigate 'Frontiers in nanophotonics: integrated plasmonic metamaterials devices'.

### Deforestation moves

Environmental monitoring expert Dr Mark Mulligan, Reader on Geography, is the recipient of several international grants. The Terra-i system ([www.terra-i.org](http://www.terra-i.org), above), which processes data from NASA's Terra and Aqua satellites to monitor changes in deforestation every 16 days, is the result of collaboration between King's, the International Center for Tropical Agriculture, Colombia (CIAT) and the University of Applied

Sciences of Western Switzerland, and is funded by the Nature Conservancy. Thanks to a new collaboration with Universiti Brunei Darussalam, Terra-i is being extended from Latin America to all other tropical areas.

UK-based faculty are on teaching-only contracts, in their overseas ventures this figure could be as high as 70 per cent. The divergence in operating styles, and the inequality in student experience, are hard to sell.'

### Collaboration

A key lesson from these examples for King's was that internationalism would be better enhanced through collaborations with overseas partners with a shared ethos and similar aims, with an emphasis on reciprocity and mutuality. 'We turned the recruitment strategy on

its head,' Professor Hoggart says. 'Internationalism would start at home, creating a faculty and student body that is more internationally-oriented. Firstly, our staff and students would be encouraged to internationalise, with financial and other incentives to encourage exchanges, joint research and joint degrees with key overseas partners. Secondly, we established a group of Global Institutes charged with enticing staff and students to engage with international partners. This enabled us to offer teaching programmes focusing on selected



King's and Hong Kong University became strategic partners in 2006.

### King's and India

One example of the long-term and multi-faceted approach that is characteristic of the College's Global Institutes is the work of the King's India Institute.

In collaboration with high-ranking colleges in the Universities of Mumbai and Delhi, King's International Summer Schools provide Indian university students and staff with an opportunity to experience King's quality teaching and learning without leaving India. Scholarships enable the best students from the Indian summer schools to join King's London summer school, and the College has also begun offering pre-university programmes for high school students in India.



### Exchanges

As a joint initiative with the British Council and Delhi University in June 2013 King's welcomed students with a range of disabilities from Delhi to a programme to develop a global perspective on disability support in higher education. A reciprocal visit to Delhi is planned for 2014. Also with the British Council, King's has secured a study abroad agreement with the state government of Tamil Nadu to receive gifted students from underprivileged backgrounds, with accompanying academics, to spend a semester at King's.

### Expertise

King's expertise on India is widely recognised – not least by the UK Foreign and Commonwealth Office (FCO), and the India Institute has recently won two prestigious contracts previously run by the

LSE and Oxford. The Gurukul Chevening programme brings selected young Indian professionals for a three-month intensive executive programme in London, while the Chevening Parliamentarians Programme enables young Indian politicians to engage with King's academics, UK policymakers and government officials. Dr Rudra Chaudhuri has served as a consultant to British commanders in Afghanistan, and worked closely with the FCO to provide confidential stakeholder conferences and workshops on the economic and political future of Afghanistan, India-Pakistan relations, and reconciliation with the Taliban, as well as tailored modules for the FCO and other government agencies.

King's Cultural Institute (see pages 12-19) partnered with the India Institute on the inaugural exhibition in King's new Inigo



countries and develop deeper relationships with those countries' business, government and third-sector institutions.'

### Global Institutes

The College's Global Institutes include King's India Institute; King's Brazil Institute; the Lau China Institute; the Institute of North American Studies at King's; King's Russia Institute, and King's International Development Institute. As with the university partnerships, the ethos for their collaborations is to increase the

development potential of both partners – the College and the country concerned – by capitalising on the College's capacity to transpose knowledge beyond academia, while maximising the potential for absorbing lessons from external sources. The College also promotes international research between as well as within each of the Global Institutes.

### Power houses

'King's strategy has prioritised countries that will be the power houses of cultural, economic, political

and scientific change in the 21st century,' Professor Hoggart explains. 'Centring our collaborations on Europe, North America, the BRIC economies (Brazil, China, India and Russia) and other so-called emerging economies (such as Indonesia, Mexico, South Korea, Taiwan and Turkey) has not lessened King's commitment to assist the less advantaged in society. A key understanding in our approach is that recently-emerging economies provide more pointed lessons for helping poorer countries than insights from more mature economies, with this

SIMON DE TREVY WHITE



Rooms exhibition space, which showed the work of India's leading photographer, Dayanita Singh (*left*). King's Cultural Institute has also supported initial research for a major exhibition on the history of twentieth-century Indian science which will be curated by Dr Jahnavi Phalkey of the India Institute for the Science Museum in 2017.

### Cancer partnership

King's Health Partners Integrated Cancer Centre (KHP ICC) has a major strategic partnership with the clinical cancer community in India. A team from KHP ICC led by Professor Arnie Purushotham, Director of the Centre, developed the first major international peer review of the Tata Memorial Centre (TMC) in Mumbai, as a model process for the rest of India's 34 regional cancer centres. As the only

non-Indian institution to be part of the Indian National Cancer Grid, KHP ICC is helping to deliver an affordable cancer care system and new policies for cancer research in India.

In 2013 Professor Purushotham spoke at the Houses of Parliament to UK representatives from industry, cancer charities and universities about the benefits of partnering with India in cancer, and in autumn 2013 a 50-strong UK trade delegation to India, focusing on cancer, culminated at the Indo-UK Oncology summit in Chennai, at which Professor Purushotham gave the keynote lecture.

'We take the view that the most sustainable, mutually beneficial partnerships are based on reciprocity, trust and constant engagement in a shared vision,' he explains. 'Global cancer health

is now a key theme for all high-income country cancer centres that aspire to excellence, and our relationship with India is based around this mutuality and solidarity.'



awareness informing King's initiatives like the Centre for Global Health and the African Leadership Centre.'

'At King's we have built on our conviction that universities should serve the interests of the wider society. This means we need to maintain our integrity and quality levels in all we do, in whatever part of the world we operate. We acknowledge that what we bring to the table is not complete. Working closely with partners thus provides a more comprehensive, and mutually beneficial, gain.'

King's future international strategy will need to take account of constant global innovation in higher education says Professor Trainor. 'We are already collaborating with international partners in areas such as MOOCs (Massive Open Online Courses),' he points out, 'through the group of 23 founding universities contracted with the Open University-led consortium FutureLearn to produce online courses available to the public free of charge.'

'Going forward, we're seeking to expand the number and type

of international mobility openings available to our students, academic and professional staff,' adds Tayyeb Shah, Director of International Strategy at King's. 'The College already has international offices in the USA and India, and is now looking to establish offices in China and Brazil. In time, these will provide bases for King's faculty and students and help support projects and visiting delegations in those countries, as well as interacting with local institutions and organisations.'

### UNC and King's

In addition to a large number of more specialised connections (such as those with Georgetown and Johns Hopkins), King's has a wide range of partnerships with leading, like-minded university institutions across the globe, involving shared research projects, staff and student exchanges and joint PhD programmes. These include the College's seven key strategic partnerships with Hong Kong University; the University of California San Francisco; Jawaharlal Nehru University; the National University of Singapore; Renmin University of China; the University of São Paulo, Brazil, and the University of North Carolina at Chapel Hill (UNC). The partnership between King's and UNC, which began in 2005, is one of the most ambitious anywhere between a US and a UK university and now covers all academic fields.

Some 60 King's and UNC undergraduates crossed the Atlantic to live and work on each others' campuses last year. Philosophy undergraduate Kathryn Nave reflected on her experience at UNC in an essay ('Gap year kids are not the new face of the Imperial Raj') which won the prestigious London Library Student Prize for 2013 and was published in *The Times*. Her essay benefited, she believes, from her experience of writing for the UNC student paper, which is run to a professional standard. 'Student media at that level seems to be distinctively American, and it's something I would have been unable to experience if I had stayed in the UK,' she commented.



University of North Carolina.

### Smart and motivated

King's benefits greatly from having UNC students in London, and Dr Robert Miles, Associate Dean for Study Abroad and International Exchanges at UNC, believes King's students are good for UNC's campus and classrooms. 'They're smart and highly academically motivated; they bring perspectives from other academic traditions and they add significantly to cultural diversity,' he said.

UNC music student Ryan Dickey came to King's for his exchange year for three main reasons: 'the opportunity for complete immersion in a school of foreign students and professors with the right balance of highly competitive academics and world-class musical instruction; the connection

at the Royal Academy of Music, and the chance to live and study in heart of the world's most global city, London. My time abroad has led to greater cultural fluency, adaptability and the solidifying of a worldview. King's has also led to new opportunities and interests, from playing field hockey with the men's club team here to my decision to continue with Ancient Greek at Carolina after taking New Testament Greek in the Theology Department at King's. In London I have traversed centuries of art and history, being a student of the past and present all at once. And of course, I've had many reflections and conversation-filled evenings in pubs even older than the United States!'



SIMON DE TREXWHITE



**International staff exchange**

The number of King’s students offered an opportunity to go abroad for part of their study has risen from 220 in 2007 to 749 in 2013, and exchange visits to universities overseas have recently been offered to King’s Professional Services staff, as well as academics and students.

**Wider understanding**

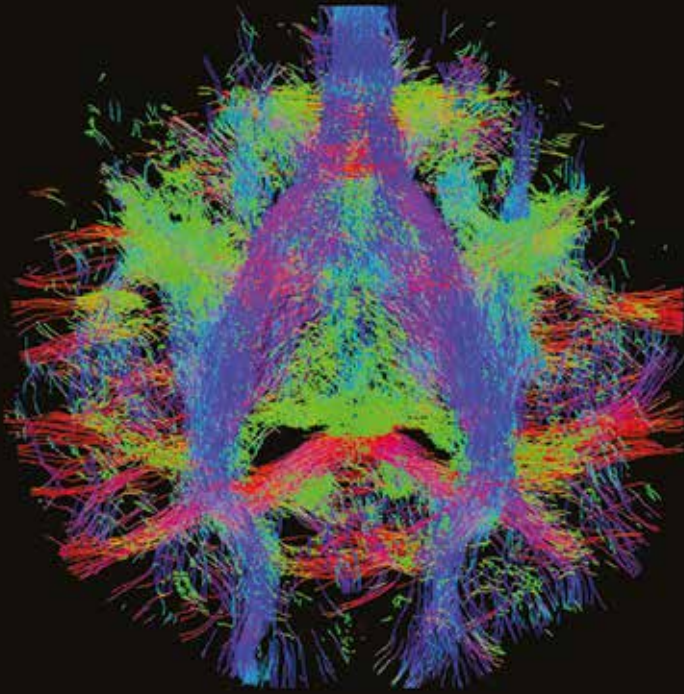
James Ackroyd, Head of Centre for Arts & Sciences Admissions, visited the University of Hong Kong in May 2013. Besides being able to improve admissions processes for the joint King’s/HKU PhD and LLB programmes, he hosted an open evening for offer holders at the British Council office and visited several key feeder schools for King’s. ‘I was surprised at the number of people who booked to come and see me speak at the British Council,’ he commented. ‘It was clear that King’s holds a high level of prestige in Hong Kong as a world class university.’

Michael Sullivan, who oversees undergraduate admissions to Arts & Humanities, visited the Universidad de Complutense in Madrid in November 2012. ‘The visit gave me a wider understanding of higher education in Europe and

increased my confidence in Spanish,’ he said. ‘The biggest surprise was that, while our overseas students are unable to gain an unconditional place without proof of English proficiency, this isn’t even considered in Spain and they often have students try to start a course who can’t speak a word of Spanish.’

Adam Baxter, King’s Senior Marketing Officer, for UK/Europe, visited the University of Cologne in late 2012, after King’s hosted a marketing colleague from Cologne earlier in the year. ‘Germany is a key market for the College, so gaining extra insight into the German education system was an obvious thing to do,’ he said. ‘The way they organised events was a big eye-opener, and their fairs were much slicker. But being able to take a step back also made me aware of the things that we already do undeniably well.’

King’s partner institutions (from the top):  
 Renmin University of China  
 University of Sao Paulo  
 University of California San Francisco  
 National University of Singapore  
 Hong Kong University  
 Jawaharlal Nehru University.



Nerve fibre bundles in the newborn brain captured by Magnetic Resonance Imaging.

# Mapping the brain

How does the human brain assemble itself? Mapping brain and nerve developments in the womb and just after birth is the challenge for a €15 million project in a unique centre led by King's.



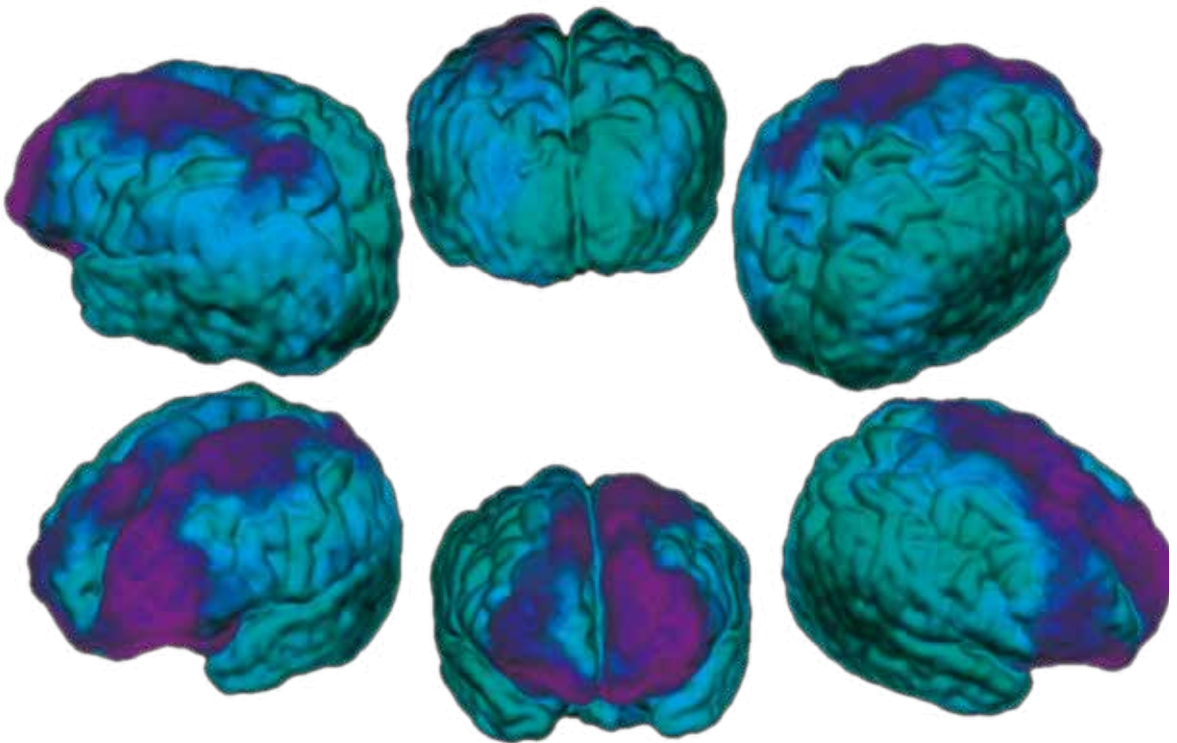
‘By the time a baby is born, the brain is developing fast and key connections between nerves are being made’ ...

says Professor David Edwards, Director of the King’s College London Centre for the Developing Brain. ‘Using world-leading magnetic resonance imaging facilities in the Evelina Children’s Hospital Neonatal Unit at St Thomas’, we’re going to map how these connections develop, and how this is affected by genetic variation or problems like pre-term birth. This will provide information that will help us to understand and develop treatments for neurological disorders such as autism, and can be made freely available to the international research community.’

One of the core facilities for the Centre of the Developing Brain is the Evelina Newborn Imaging Centre, opened in February 2013. This is the only centre in the world with an MRI scanner sited in a custom-built clinical research

facility within a neonatal intensive care unit, making it possible to undertake advanced research projects with MRI for even the smallest and most vulnerable newborn infants. Over the next few years, in a project funded by a €15 million grant from the European Research Council, Professor Edwards and his colleagues will build up a diagram of connections in the brains of babies as they develop in the womb and then after they are born.

‘The aim is to understand how the human brain assembles itself from a functional and structural perspective. The resulting map is a *Connectome*: a name which reflects the fact that it aims eventually to characterise all the connections in the brain, just as the human genome catalogues all human genes,’ explains Professor Edwards,



An MRI image of the brain of a newborn baby. This surface map shows the regions which have most connections in blue.

*'The aim is to understand how the human brain assembles itself from a functional and structural perspective'*

who is a Consultant Neonatologist and Professor of Paediatrics & Neonatal Medicine at King's.

### **Motion-tolerant MRI**

At the heart of the project is the development of motion-tolerant MRI image analysis techniques. MRI scanners work by taking a series of cross-sectional images of a body and are then reconstructed by software into 3D images. Usually, subjects entering an MRI scanner must remain as still as possible and are often held in place to make sure that the resulting scans are clear.

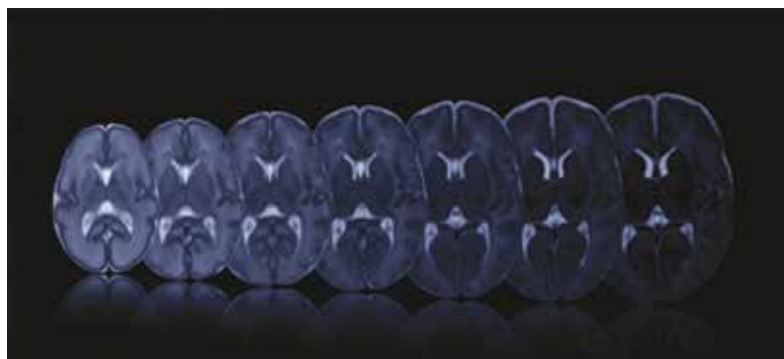
Babies from the intensive care unit at the Centre are scanned while they are asleep and not moving. However, before birth, babies float freely inside the womb and are therefore continually moving. Until recently, the only way of scanning foetuses has been

to use single-slice techniques that 'freeze' this motion. However, as Professor Edwards says, 'Sophisticated neuroscience doesn't work on a slice. If we are to do a connectivity map of the brain and understand how the brain develops we need to look at 3D structures.'

### **A richer image**

The team at the Centre has developed a technique that allows for a much richer image of the foetus's brain in the womb. It involves taking a number of cross-sectional images of the brain at different angles and reconstructing these two-dimensional images into a 3D model. This makes it possible – for the first time – to see the connections forming in the baby's brain while still in the womb. These techniques, together with similar methods for studying small babies

An MRI image showing the growth and development of the human brain before the normal age of birth.



The Centre's facilities make it possible to undertake advanced MRI projects for even the smallest and most vulnerable newborn infants.



after birth, are central to developing the Connectome which will eventually provide a four-dimensional map of the brain, charting its development in space and time.

### Better medicine

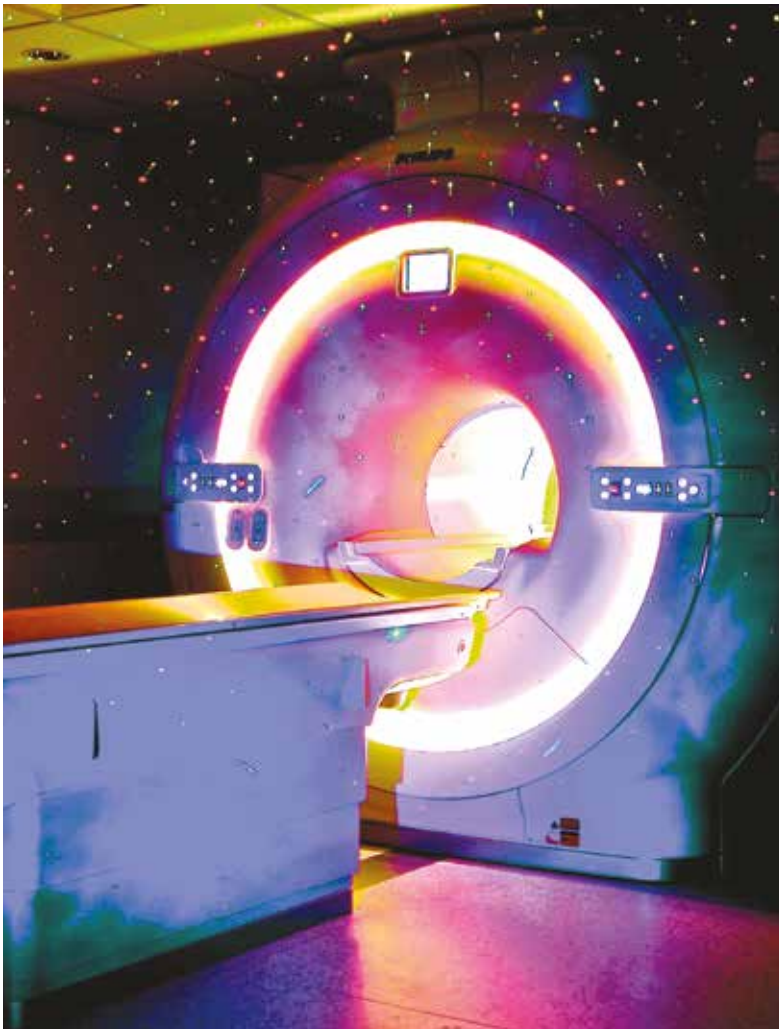
The MRI scanner is also used for diagnosing sick newborn babies, allowing clinicians and researchers to monitor the effect of certain treatments such as drugs administered to protect brains and help these brains develop under the stress of a premature birth. Before the launch of the Centre, babies in intensive care would have to wait until they were healthier before being transferred to an MRI scanner. 'We're looking after very vulnerable infants, and trying to understand how their brain development is affected by their

medical conditions,' Professor Edwards says. 'Having a scanner sited within the intensive care unit means that we can safely study the babies at highest risk and in most need of help.'

The imaging suite will also be used for studying conditions such as autism and other neurological disorders in young children, and the team makes every effort to enable patients and parents to feel comfortable. Lighting can be dimmed and tinted to make mothers feel relaxed, or swirling galaxies projected onto the walls to turn a visit to the MRI scanner into a space mission for imaginative children.

### Goal

The goal of the Centre for the Developing Brain is to reduce the number of children who suffer brain



The MRI scanner in the Evelina Newborn Imaging Centre at St Thomas' Hospital, during its installation.

Swirling galaxies can be projected onto the walls to turn a visit to the MRI scanner into a space mission for imaginative children.

damage in the perinatal period, through understanding human brain development around the time of birth; creating new capabilities to map cerebral development in health and disease; exploring and exploiting the underlying biology of brain development disorder to create new therapies, as well as conducting clinical trials of novel neuroprotective and neural rescue therapies.

The Centre has established a comprehensive and integrated capability to achieve these ambitious goals, combining groups working in basic and translational neurobiology; MR imaging development, analysis and application; and clinical studies of the human foetus and infant.

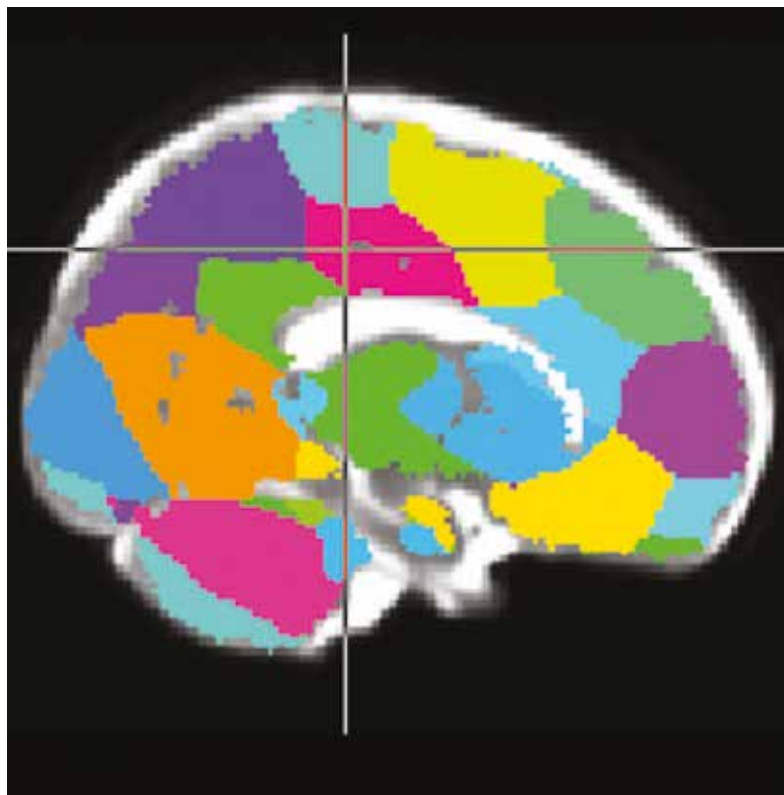
‘We have a strongly collaborative approach, working with colleagues around the world,’ says Professor

Edwards. ‘In particular, we work with colleagues at Imperial College London (most notably Professor Daniel Rueckert who is a longstanding member of the Centre), and with clinicians and scientists within King’s Health Partners, such as Dr Chiara Nosarti from the Institute of Psychiatry. A major goal for the coming period will be to develop collaborative studies of autistic spectrum disorders and attention deficit and hyperactivity disorders, and to work with the MRC Centre for Developmental Neurobiology on translational studies of basic neurodevelopmental mechanisms.’

DAVID COX



The Evelina Newborn Imaging Centre was opened in February 2013 by Professor Dame Sally Davies, Chief Medical Officer for England. The scientific symposium that accompanied the opening included keynote lectures by Professor Sir Mark Walport, Government Chief Scientific Advisor, and Professor Daniel Rueckert of the Department of Computing at Imperial College London.



The MRI scanner can detect activity in all areas of the brains of newborn babies.







'Rudolf II of Habsburg  
as Vertumnus'  
by Giuseppe Arcimboldo



# Feed your mind

Research on food and eating extends across all King's Schools of study: from medicine and biomedical science to arts and humanities, and from psychiatry to social science. The College has been celebrating this feast of ideas.

Food is central to the human daily routine the world over, and it has long been the focus of scholarly interest, ...

as Dr Mike Goodman, Senior Lecturer in the Department of Geography, points out. But now, he says, there is something *different* about Western food-based behaviour: 'We're in the midst of a broad-based "food turn" across the social sciences, humanities and society at large. Popular culture has taken to food with a vengeance. It's everywhere and in every medium: magazines, television channels, internet sites, and top-selling cookbooks and books about dieting.'

Dr Goodman is particularly interested in the celebrity chef as a key figure in this foodscape. 'Like other celebrities – such as Bono with his involvement in poverty and development, or Leonardo DiCaprio as an "eco-celebrity" – these chefs are now in the business of attempting to change our behaviour and our engagement with the wider world,' he says. 'In particular, they want to govern our relationship with "good food".

'According to our research, audiences are becoming more comfortable with philanthro-

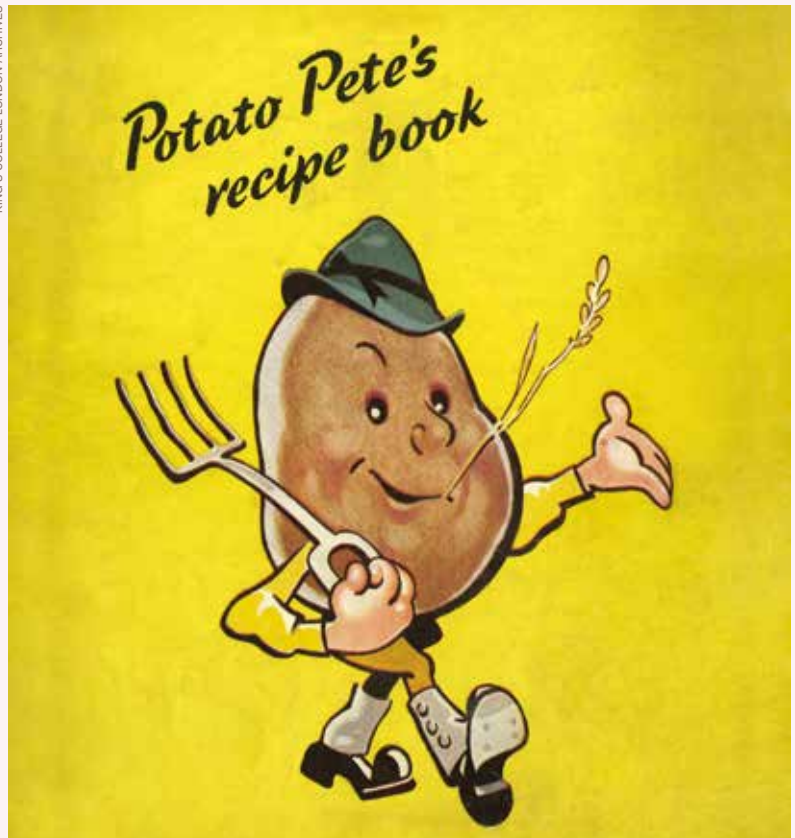
capitalism, whereby people and businesses are motivated by doing "good" by doing well financially. The respondents in our survey thought these chefs *were* motivated to get involved in food politics because of their personal concern over issues such as healthy eating or sustainable fish, although this was also a way for them to raise their personal profile and expand their "brand". Since such figures do appear to influence on the way people think and engage with food and food politics, any analysis of food in contemporary society must take seriously the role of so much food media, and especially the celebrity chef.'

### Festival

Dr Goodman was one of the contributors to the King's *Festival of Food & Ideas*, held in March 2013. Devised and organised by the College's Public Engagement Department, it attracted nearly 3,000 visitors to learn about all aspects of the College's research in this area, through 24 talks and debates, together with an exhibition on animal



KING'S COLLEGE LONDON ARCHIVES





feeding habits; a display on the culture and science of food curated by the College Archives, and an art installation, *The Whisky Tornado*, created by studio Bompas & Parr.

## Chocolate

One of the most popular, sold-out, Festival events, 'The Science of Chocolate', led by Clive Page, Professor of Pharmacology at King's, explored the history, chemistry and physiological properties of one of the world's most complex natural substances. Chocolate contains more than 300 different chemical elements and produces more than 500 flavour components. First grown in the Gulf of Mexico more than 4,000 years ago, chocolate was brought to Europe by the Spaniards in the 16th century and became hugely popular as a drink, but was first made into bars by Fry's only in the 19th century. 'According to a recent study, people who eat chocolate appear to live almost a year longer than those who don't,' Professor Page pointed out. 'This could be because of the high level of anti-

oxidants in dark chocolate: twice as many as in prunes, and close to the level in broccoli. Anti-oxidants are known to be useful in preventing cancer and cardiovascular damage. This could be good news for the average person in the UK who consumes more than seven kilos of chocolate a year.'

## The dark side of food

By contrast, another sold-out session, held at the Institute of Psychiatry at King's, discussed the dark side of food, including eating disorders, comfort eating and food addiction.

A panel of experts led by King's Professor Ulrike Schmidt discussed why food may become the source of dread for some people and for others the source of excessive desire, and whether eating disorders and obesity are self-inflicted problems. One hotly-debated topic is whether there is such a thing as food addiction.

The Eating Disorders Unit at the Maudsley Hospital and the Institute of Psychiatry is renowned worldwide. It was founded by Professor Gerald Russell, who in

1979 published the paper on bulimia nervosa that coined this term. Professor Schmidt, Head of the Eating Disorders Section of the Unit, says that by contrast with anorexia nervosa, which is a highly visible disorder where families are very involved, bulimic disorders are often a shameful secret for the person, and sufferers find it very hard to ask for and access help. 'Being able to offer them self-directed treatments is often a really important first step in treatment and sometimes a sufficient treatment in itself,' she points out.

In the future, Dr Schmidt believes treatment methods will utilise the growing understanding of the neural basis of eating disorders. 'We are now in the position to test brain-directed adjuncts to classical talking therapies for eating disorders, such as non-invasive repetitive transcranial magnetic stimulation, fMRI neurofeedback, and computer-based attention bias modification often used in anxiety disorders. This is an active focus of research for us.'



'Gluttony' from *The Seven Deadly Sins* after Pieter Breughel the Elder, 1558.  
Copyright: [www.bridgemanart.com](http://www.bridgemanart.com)



*'Once Britain prided itself on getting food from abroad: it was a mark of modernity, and of wealth, to get one's food from where it grew best.'*

### **Beefing up Britain**

Some of the most potent myths about British beef are challenged by Professor David Edgerton in his account of the story of Fray Bentos, the famous brand of corned beef and meat pies, which originated in the town of the same name in Uruguay.

'Once Britain prided itself on getting food from abroad: it was a mark of modernity, and of wealth, to get one's food from where it grew best,' he explains. 'For much of the 20th century most of the roast beef of England in fact came from the other side of the world. Whereas British beef production was small-scale, British breeds of cattle such as the Aberdeen Angus and the Hereford flourished on the pampas, and were brought back as whole sides of beef, often prime beef, by British and US companies.

'While the distance travelled was long, the supply chain was very short and (with the ship acting as a floating cold store) the 21-day voyage to London from the River Plate could produce a dry-aged, organic beef of around 28 days – a premium product.'

In the 1920s some 80 per cent of the beef eaten in London was imported from the River Plate. 'But after the Second World War there was a period of intense food nationalism, predating the Common Market and peaking in the 1980s. By the 1990s, 80 per cent of beef consumed here was produced in the UK, with most Fray Bentos products coming from Lincolnshire and now from Scotland.'

However, as Professor Edgerton points out, this has also been the period of mad cow disease and the horsemeat scandal, implicating British farmers, supermarkets and processors. 'Distance does not mean low quality – and local does not mean good quality,' he warns. 'Foreign food is not necessarily bad, and national food not necessarily good. The distance food travels is a very different matter to the length of the food chain. Beware calls for national food security if you care for the quality of food!'

MARY EVANS PICTURE LIBRARY

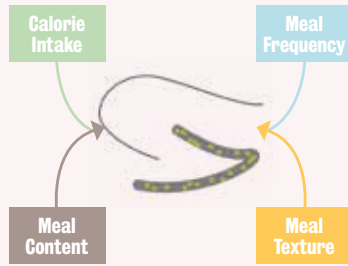


David Edgerton is Hans Rausing Professor of the History of Science & Technology and the founding Director of the Centre for the History of Science, Technology & Medicine (CHoSTM) which moved from Imperial College to King's Department of History in August 2013. The highly-ranked Centre is known for its distinctive approach to integrating the modern history of science, technology and medicine, and for its concern to address big historical and policy questions. Its new MA in Science, Technology & Medicine in History started in October 2013.

### Diet and neurogenesis

'We're very conscious that our physical health can be affected by what we eat, but much less aware of the impact of food on our mental health,' says Dr Sandrine Thuret, Lecturer in Neural Stem Cell Research at the Institute of Psychiatry. 'In fact, research over the

last 10 years has firmly established that learning and memory abilities, as well as mood, can be influenced by diet, and our research is exploring the mechanisms that may account for that.

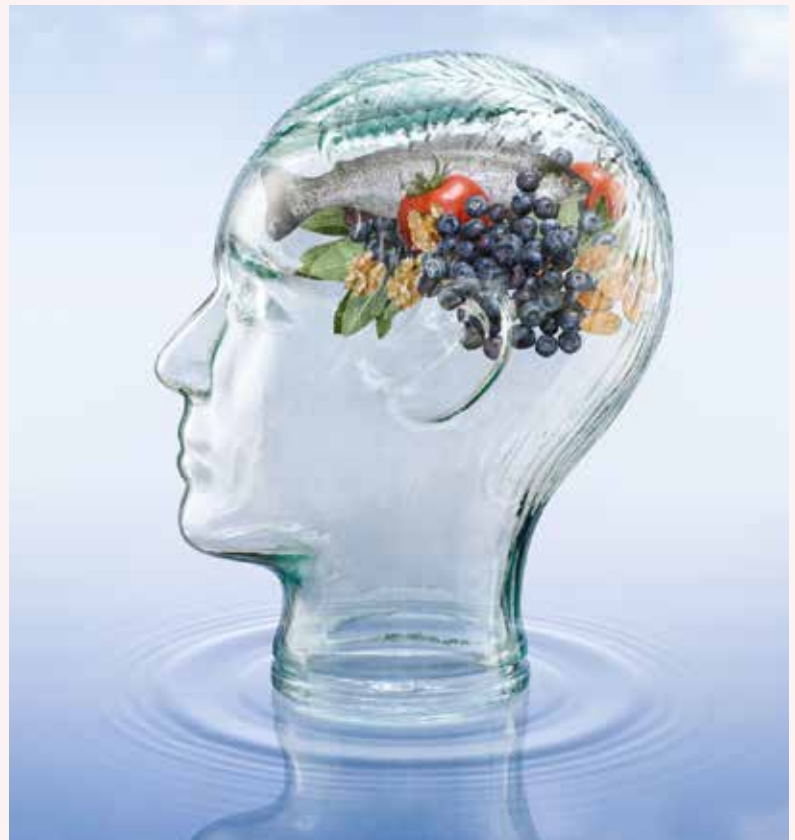


An overview of the four different ways in which diet impacts on neurogenesis in the hippocampus of the adult brain. The yellow dots represent newborn neurons.

'The hippocampus is one of the two structures in the adult brain where the formation of newborn neurons (or neurogenesis) persists. New neurons increase memory capacity, reduce interference between memories and add information about time to memories, and the level of neurogenesis in the adult hippocampus has been linked

directly to cognition and mood. So studying the modulation of this process by diet may lead to novel dietary approaches for disease prevention and healthier ageing.'

Dr Thuret is particularly interested in the beneficial effects of fasting. 'There are already studies showing that restricting calories quite dramatically increases neurogenesis in mice. What our research has found is that the effect is not actually caused by the calorie restriction itself, but is due to the fact the mice are eating only every other day. The fasting puts a mild stress on the brain, and it could be that this response is left over from our primal years, from times when there was no food – so we had to increase our number of neurons to search for food more efficiently. There has already been some research showing that, in people over 70, intermittent fasting led to a 30 per cent improvement in verbal memory after three months, which is quite dramatic. We now want to find out whether this was due to neurogenesis, and we're planning our own studies on humans.'



## The proof of the pudding

‘Accurate, reliable, informative and accessible food labelling is right at the top of the agenda as a means of tackling issues such as obesity, high blood pressure, diabetes and heart disease,’ explains Professor Alan Maryon-Davis of King’s Department of Primary Care & Public Health Sciences. ‘We see claims such as “low fat”, “low salt” or “rich in polyunsaturates”, but until now there have been no agreed definitions for these terms and no proper regulation of their use (and misuse).’

Over the past 20 years, attempts have been made by health organisations and the Food Standards Agency to come up with a uniform validated standardised approach to labelling. However, the food industry has fought to avoid the ‘traffic-light’ scheme which gives foods red, orange or green spots according to whether they are ‘high’, ‘medium’ or ‘low’ in fat, saturated fat, sugars, salt and calories.

Instead, powerful food manufacturers, such as the dairy

sector, the breakfast cereal manufacturers and the confectionery and biscuit makers, concocted an alternative scheme which would avoid (as they saw it) “stigmatising” certain products. This was the ‘Guideline Daily Amounts’ (GDA) scheme, which expressed each product’s key nutrient content as a percentage of an adult’s ‘guideline daily amount’ for each nutrient.

‘However, consumer research showed the GDA scheme to be poorly understood by consumers, particularly those on lower incomes who might need the information most,’ Professor Maryon-Davis points out. ‘The GDAs were also based on the average adult, and were therefore irrelevant for children. Moreover, the term ‘guideline’ implied that people should aim to consume those amounts each day – whereas in fact these were the recommended daily *maximums*.’

Nevertheless, most of the industry went with GDAs, whilst a few supermarket chains and manufacturers favoured traffic-

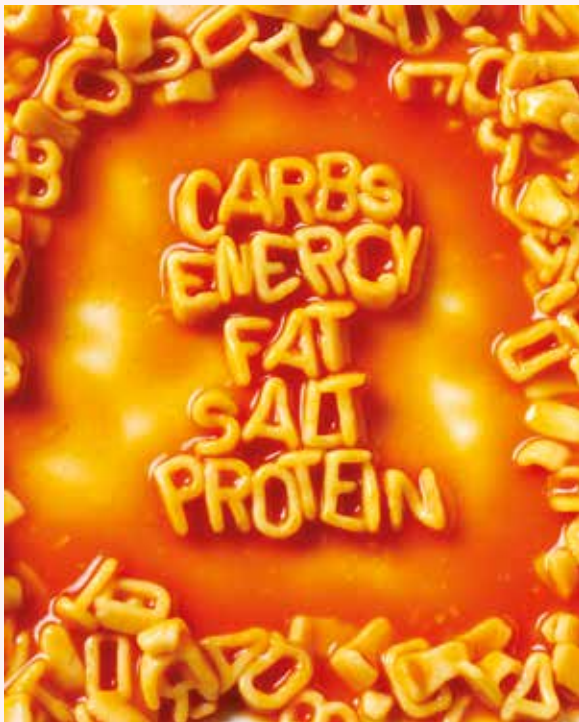
lights. The result was much confusion among consumers.

The battle-lines were drawn with the ‘health lobby’ versus the food industry: at first at UK level and then, over the past decade, in the European Union.

‘In the end, the industry got most of what it wanted. From 2014 there will be EU-wide adoption the GDA scheme, but with some leeway for individual member countries to include traffic-lights if they choose. The UK government is developing a hybrid, voluntary, scheme using both traffic-lights and GDAs, which will appear on a wide range of (but not all) food products.’

per 30g cereal					
16	ENERGY 460kJ 110kcal	FAT 0.7g LOW	SATURATES 0.1g LOW	SUGARS 5.1g HIGH	SALT 0.2g MED
8	0%	2%	1%	8%	4%
SERVINGS					
% of an adult's reference intake.					
Typical values per 100g: Energy 1539kJ/360kcal					

All the main supermarket chains and a significant proportion of the main food manufacturers have signed up to it, with a national public education campaign to help consumers to make best use of the new system.’



Grains were consumed in the mediaeval period in the form of pottage: a thick soup of grains and vegetables.



## Peasants, pestilence and pottage

‘Some fantastic images spring to mind when we think of medieval food: such as porpoises, herons, swans and peacocks, and boars’ heads served on huge platters. But such banquets were beyond the wildest imaginings of the peasants who constituted three-quarters of the population of mediaeval England,’ explains Dr Alexandra Sapoznik, who teaches an MA module on food and drink in mediaeval England.

Grains made up perhaps 75 per cent of the peasant diet, Dr Sapoznik says, pointing out that this is very close to the edge of malnutrition, since only 80 per cent of a human diet can be composed of grain before lack of vitamins, minerals and proteins poses a serious risk to health. Much of this was consumed in mediaeval times as pottage (a thick soup of grains and vegetables) and grain was also used to brew ale. ‘But whereas boiling grain into pottage loses very few calories, 20 per cent of the potential calorie value of grain is lost when it is consumed as bread and 70 per cent of potential calories are lost when it’s brewed into ale.’

In her case study of the Crowland Abbey manor of Oakington, Cambridgeshire, Dr Sapoznik has modelled the income of an average peasant holding of 11 acres, which could have supported up to eight people on 1,100 calories of grain a day. ‘However,’ she points out, ‘some of this grain would have gone to feed livestock, and to pay for rent, maintenance, taxes, fines and fees.’

Although the peasant diet was meagre and monotonous, the population rose until by 1300 there were perhaps 5.5 million people in England. ‘And then, from 1314 to 1316, there were three successive years of spectacularly bad weather resulting in harvest failure. This was an acute symptom of long-term climate change, as a thousand-year warming period ended, replaced by cool wet summers and harsh winters.’

England may have lost 10 per cent of its population during these years of famine. But there was much worse to come, and the arrival of the Black Death in 1348 meant that within two years up to 48 per cent of the population of England had

died: a fundamental turning point in the medieval economy.

‘Whereas in 1300 population growth was outpacing available resources, and lots of people were trying to make a living from very little land, after the Black Death wages rose due to shortage of labour, and prices fell as demand from a vastly diminished population declined. In 1375 there was a very good harvest: the first of a long series. Supply of food now surpassed demand, and prices came tumbling down, ushering in an era of cheap and plentiful food.’

‘Now people wanted more wheat and less rye, more high-quality, stronger ale, and above all more meat. Standards of living for the majority of the population improved, through access to more land and lower rents, through higher wages and better and more plentiful diets: the beginning of what has been called “the golden age of English peasantry”.’



A reeve overseeing harvest works from the image for August in the *Queen Mary Psalter*, illuminated by the Master of the Queen Mary Psalter, 1310-20.



$J_C$   
Cauchy's Theorem

$$\int_{\Gamma_\varepsilon} f(z) dz = 0$$

$\Gamma_\varepsilon$  Since the



# Changing the game

A specialist sixth-form school that will produce brilliant mathematicians is part of King's response to its own academics' research showing the UK's 'scandalous' record in mathematics education.

# The King's College London Mathematics School opens in September 2014 as a flagship initiative in the Government's plans to improve mathematics education in the state sector.

Funded by the Department for Education, the College-sponsored school is for highly motivated students aged 16 to 19 with a particular aptitude and enthusiasm for mathematics, who will pay no fees and will include those with limited access to high-quality mathematics education elsewhere. Expected to be the country's highest-performing state school and a leading provider of mathematicians, physicists, engineers, statisticians and computer scientists, its students will attain the highest grades for studying science, technology, engineering and mathematics (STEM) subjects at top-rated universities.

Headteacher Dan Abramson describes the school as 'game-changing', in particular because it will enable students with intense interest and exceptional ability in mathematics to study with a critical

mass of students with the same passion. 'The 60 pupils in each year group will learn to think like mathematicians,' he says. 'They'll meet ideas in mathematics and physics that will astound them and will inspire them to think creatively, independently and rigorously about all their learning.'

'They'll have the unique opportunity to learn not only in the classroom under the guidance of skilled and dedicated teachers, but also with and from the students and staff of King's College London,' he points out.

## Reputation

The mathematics school project builds on King's existing reputation for research and teaching excellence in the field of mathematics, involving both the College's highly-rated Department of Mathematics

ED PARKS



The King's College London Mathematics School ([www.kcl.ac.uk/mathsschool](http://www.kcl.ac.uk/mathsschool)) will attract the best mathematical brains in the capital.



and its renowned Department of Education & Professional Studies. It is led by Professor Alison Wolf, Sir Roy Griffiths Professor of Public Sector Management at King's and author of the 2011 *Wolf Review of Vocational Education*, which suggested it was 'scandalous' that half of all 16-year-olds in England, Wales and Northern Ireland were leaving school without good GCSEs in English and mathematics. Professor Wolf's report recommended that all pupils should study a core of academic subjects until they are 16 and that those without a good pass in GCSE English and Mathematics should continue their studies until they are 18.

This policy, which has now been fully implemented by the English government, was also recommended

as a result of two research studies for the Nuffield Foundation carried out by a team led by Professor Jeremy Hodgen of King's Education Department. The first, published in 2010, showed that fewer than one in five students studied any kind of mathematics after GCSE, representing the lowest levels of participation in a comparative study of 24 countries, whilst the second recommended that all young people should study mathematics at least until they are 18 even if they have already gained a good GCSE in the subject. The recommendations of both reports have been strongly welcomed by Education ministers.

### Poor standards

The Department's research has for some time been highlighting the country's poor standards in mathematics education. In 2012

Professor Hodgen's ESRC-funded research demonstrated that, despite a dramatic rise in examination pass rates, an analysis of secondary pupils' performance in algebra, number and ratio tests suggested that there had been a fall in mathematics attainment since the 1970s. In 2013, a study for the Sutton Trust provided further evidence to support the study of mathematics to 18, because the current GCSE curriculum fails to give students the problem-solving and modelling skills in statistics, modelling and other practical applications that are needed in the modern workplace.

King's has already been involved in several initiatives aimed at reversing this situation and encouraging higher standards in mathematics education and attainment, as part of its widening participation and

ED PARKS

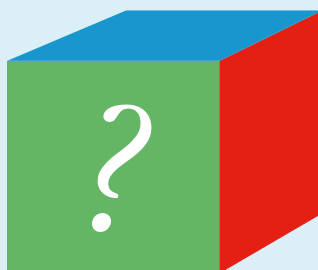


### Weekly challenge 6

Nancy has a wooden cube. She paints two faces of the cube red, two faces green, and the last two faces blue.

Nancy notices that of the cube's 12 edges, the number of edges which border two different colours is odd.

**Is this enough information to determine how the cube was painted?**

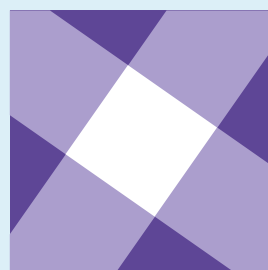


### Weekly challenge 14

Four identical light purple triangles sit within a large square.

The total area of the dark purple regions, where the triangles are overlapping, is equal to the total area of the central white region.

**What proportion of the area of the large square is each of the triangles?**



The School's weekly maths challenge (see [www.kcl.ac.uk/mathsschool/Weekly-maths-challenge.aspx](http://www.kcl.ac.uk/mathsschool/Weekly-maths-challenge.aspx)) encourages responses from anyone who can solve the problem and posts the first correct response online.

outreach activities across many subject areas. The College's highly successful mathematics widening participation programme – known as the 'King's Factor' – offers A-level students who relish and enjoy mathematics the opportunity to tackle challenging maths problems which enrich and develop their thinking, and brings them together with students and teachers from other schools and colleges who share an enthusiasm for mathematics. While encouraging students to study mathematical subjects at King's and other universities, the programme is intended for all those who enjoy mathematics, and one of its main messages is that mathematics is valuable in ways which are not always immediately obvious.

The College's Department of Mathematics also organises an

annual conference for mathematics teachers, and hosts 'taster' days for Year 12 students to experience life at a London university, including academic teaching methods and the additional facilities available, before making their UCAS applications.

### Enrichment sessions

Now the new sixth-form King's College London Mathematics School is offering a series of enrichment sessions to encourage students to seek entry to the new school with the confidence that they can start the study programme with the relevant level of skills. Students tackle non-routine and challenging problems with an emphasis on mathematical rigour and on oral discussion, argument and collaboration. As part of its wider mission to become a centre of excellence in the mathematics

community, the School has received a grant from the London Schools Excellence Fund (LSEF) to run a professional development programme to improve the subject knowledge and associated pedagogy of teachers new to Further Mathematics A-level teaching. The LSEF project will not only up-skill teachers but will also create a network of mutually supportive schools centred around the King's school.

Education Secretary Michael Gove has described the King's mathematics school as 'an excellent example of a world-class higher education institution playing an active role in preparing gifted young people for the rigours of university study' and 'an inspiration to others'.

*'an excellent example of a world-class higher education institution playing an active role in preparing gifted young people for the rigours of university study'*

DEPARTMENT FOR EDUCATION



Education Secretary Michael Gove awarded prizes to the winners of a mathematics competition for year 10 and year 11 pupils, run by the King's Mathematics School and the Exeter Mathematics School, at the Department for Education in November 2013. Ollie Springate, Meghan Takwani, Katie Darnell-Smith and Shannon Jackowski from the Harris Academy, South Norwood, Croydon, demonstrated their mathematical and communication skills by providing a solution to 'Pascal's problem of points'.

## Dan Abramson

Dan Abramson, the founding Headteacher of the King's College London Mathematics School has a first class degree from Cambridge University and a Certificate of Advanced Study in Mathematics. He comes to King's from Highgate School, where he was Head of the Mathematics Department from 2007 to 2013, and had also led Highgate's Outreach Programme, bringing him into contact with pupils and staff from a wide range of London schools.

'The challenge of taking a student to a higher level is the same wherever you are,' he says. 'It's in the teaching. To truly teach maths is to take it beyond the processes into a proper understanding of the concepts. Once you do that it opens up into the most exciting subject imaginable. It's the only place in

the curriculum where you get to be in charge of your own world.

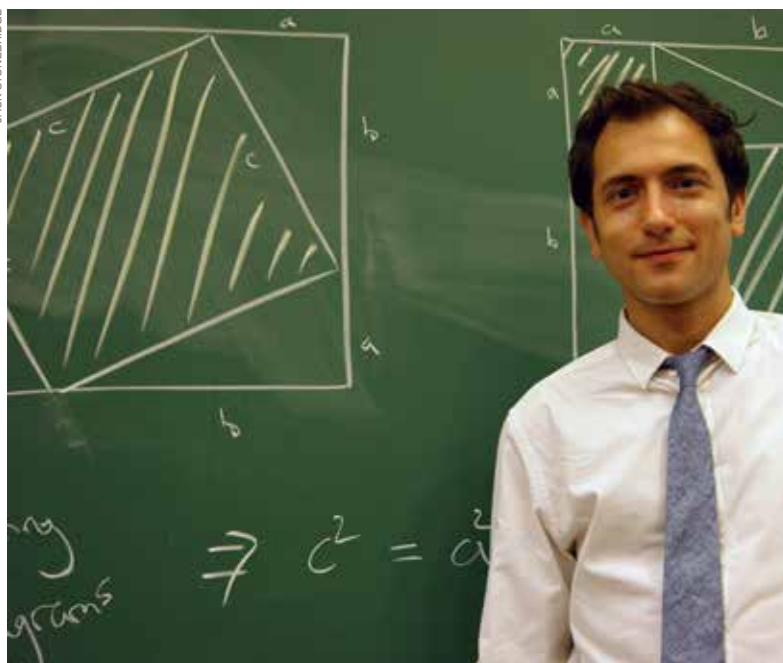
'It would be doing maths a disservice to say that it has become more exciting. It's always been exciting. But the world is changing and there are more ways to apply mathematics than ever before. Whether it's analysing the economy or locating a lost child, the realms of mathematics are stretching further and further. As computers become increasingly powerful, the possibilities are extraordinary.'

Abramson describes himself as both privileged and excited to be appointed as Headteacher of the King's school. 'I enjoy fiercely the study of mathematics, and know first-hand how stimulating it is to be in an academically challenging environment surrounded by learners with similar interests, who become your friends and spur you on to

achieve more and develop further than you think possible,' he says.

His students will learn mathematics, and to apply mathematics in physics, together with a wider array of skills that include programming and computer science. 'They will also acquire understanding of some ideas in humanities, in particular a philosophical approach to learning in general that centres on how they go about learning and what knowledge is,' he explains. 'The point of the broader curriculum is to expose pupils to a whole range of different modes of thought which gives them a skill of applying logical and deductive reasoning in non-mathematical contexts.'

JACK STONEBRIDGE



Dan Abramson, the School's founding Headteacher.



King's College London Mathematics School is based in Lambeth Walk, close to the College's Waterloo Campus.







KING'S COLLEGE LONDON ARCHIVES

# From WC2 to SE5

It is 100 years since  
King's College Hospital  
moved from Portugal Street  
to Denmark Hill.  
Dr Christine Kenyon Jones  
describes the move.

King's College London in the Strand had a medical department from its opening in 1831. For its first nine years, however, the College had no hospital where its medical students could gain the practical medical experience they needed to achieve their degrees and professional registration.

The first King's College Hospital was established in 1840 by Dr Robert Bentley Todd, the College's enterprising Professor of Physiology & Morbid Anatomy, in what had formerly been the Poor House of St Clement Dane's Church in nearby Portugal Street.

This area was described by contemporaries as 'teeming squalid courts'; 'close, foul, and filthy lanes and alleys'; 'streets of evil fame'; 'an insanitary crowded warren densely populated by the very poor'; and 'one of the worst quarters of London', and the Hospital was itself built on top of a graveyard and next to the slaughter-houses of Butcher's Row. This setting did, however, provide exactly the 'rich clinical environment' that King's student doctors needed: in other words, a population with many challenging, interesting and varied diseases and medical

conditions from which they could learn their profession.

### The first KCH

The first King's College Hospital treated more than 150,000 sick people in its first decade, and its 120 beds were sometimes occupied by two or three patients at a time. Dr Todd and others soon realised the building was inadequate to need, and it was replaced on the same site in the late 1850s by the second King's College Hospital. This was an altogether different building, purpose-designed and constructed at the cost of £50,000, with 200 beds in wards around an impressive four-storey entrance hall, an operating theatre seating 300 student observers, and a handsome chapel in 'cinquecento' style.

It was in this building that one of King's most famous staff members,

KING'S COLLEGE LONDON ARCHIVES



The area around the Hospital was described as 'one of the worst quarters of London'.



Joseph (later Lord) Lister, Professor of Clinical Surgery, carried out his pioneering operations using antiseptic techniques, introducing a system that would revolutionise surgery and save countless lives.

**Slum clearances**

Changes began in the area in the 1870s, with the building of the Royal Courts of Justice. By 1903 slum clearance was making way for new, wide streets – the Aldwych and Kingsway – and the neighbourhood of Portugal Street was being transformed from a residential slum into a business district with few permanent residents. Medical students could no longer produce the evidence they needed of having treated many different diseases or attended at least 20 births, and a third of the Hospital’s patients were now

coming from Brixton, Camberwell, Lambeth, Dulwich and Nunhead.

**To the suburbs**

It was in these circumstances that King’s became the first hospital to adopt the recommendation of the 1892 Select Committee of the House of Lords that the central London hospitals should move out to the suburbs. It was not a unanimous decision, and some members of the Committee of Management resigned in protest. Westminster City Council was also strongly opposed, and the matter had to be resolved by an Act of Parliament, passed in 1904.

The question of where exactly the Hospital should move to was settled by a magnificent gift of 12 acres in Camberwell from the Honourable William Frederick Danvers Smith. WFD Smith, later

Lord Hambleden, was a member of the WH Smith family of stationery and bookselling fame, who was Treasurer of the College and Chairman of the Hospital’s Building Committee. As soon as the Hospital moved out of Portugal Street, on 15 July 1913, its building was knocked down – and made way for the new headquarters building of WH Smith and Son. The company moved out in the 1970s, and today the block – just around the corner from King’s new Virginia Woolf Building in Kingsway – is part of the Lionel Robbins Building of LSE.

Between April 1840 and July 1913, King’s College Hospital in Portugal Street had treated 1,790,630 patients.

KING’S COLLEGE LONDON ARCHIVES



The second King’s College in Portugal Street was a substantial four-storey building.

KING’S COLLEGE LONDON ARCHIVES



Joseph Lister as Professor of Surgery at the second King’s College Hospital. Practitioners came from all over the world to observe his successful methods of antiseptic surgery, adding greatly to the fame of the Hospital and the College.

## Denmark Hill

Denmark Hill's name derives from the residence there of Prince George of Denmark, consort of Queen Anne, at the end of the 17th century. In the early 1900s William Pite, the architect of the third King's College Hospital, described it as 'a borderland between the squalor of Camberwell and the ever-growing residential suburbs on the outskirts of the metropolis. A high and healthy situation [with] a proximity to a certain amount of open country, or at least ground covered but thinly with solid houses with large gardens and fields.'

The material given to the press at the site in February 1911 speaks of the 'outlook across the lovely wooded grounds of Ruskin Park ... the beauty of the country and the

inestimable benefit of the fine air of Denmark Hill,' but it also mentions the 'County Council tramway ... affording valuable means of cheap and speedy access'.

## Modified pavilion

The new Hospital was designed on the 'modified pavilion' basis, with wards connected by covered passageways: drawing on Florence Nightingale's theories about bad air or 'miasma' and the need to be surrounded by clean air on all sides.

Its foundation stone was laid on the new site by King Edward VII in 1909, and the Hospital was opened on 26 July 1913 by King George V and Queen Mary, who were apparently especially interested in the ice-making plant. Their Majesties also inspected the other new technologies with which the

Hospital was equipped, including the diesel engines which generated its electricity, and the heating, with its 18 miles of steam piping and more than a thousand radiators.

The dedicated building for the Medical School was opened two years later, in October 1915, with a tiered lecture theatre, library, common rooms and the Dean's offices. By then, however, most of the Hospital had been commissioned for War use. In 1918 the shortage of male students prompted the Medical School to admit women students for the first time, making King's the first mixed medical school in London.

## Separation

King's College and its Hospital had been separated by the Act of 1904, but the medical school

KING'S COLLEGE LONDON ARCHIVES



KING'S COLLEGE LONDON ARCHIVES



remained part of the College, and the separation of these two bodies was not in fact necessitated by the move to Denmark Hill, but by the somewhat strange decisions a few years later of UCL and King's to 'incorporate' themselves into the University of London, rather than remaining simply its 'Associated Institutions'.

This 'incorporation', in 1910, meant that the College would separate itself legally from several of its constituent parts, including its Theological Department (which trained Anglican ordinands and could not be incorporated into the secular University of London); the King's College School, which had moved to Wimbledon in 1897, and the College's medical school. For the next 73 years, King's College, University of London, and King's

College School of Medicine were separate institutions within the University of London, one teaching pre-clinical medicine and the other providing clinical studies.

Both staff and students soon began to see this separation as regrettable, and to express the view that medicine should be taught without any sudden artificial break. This issue was not resolved, however, until after the reunification of the medical school (now also incorporating a dental school, added in 1923) with the College, and the subsequent provision of an integrated medical curriculum.

The integration of the College and the hospitals where its students learn to practice, and where much of its medical and dental research is carried out, has since become closer still through the foundation in 2008

of King's Health Partners. This created the UK's largest Academic Health Science Centre, which joins King's College London with the NHS Foundation Trusts of King's College Hospital, Guy's and St Thomas' and the South London and Maudsley, in order to bring together world-class research, teaching and clinical practice for the benefit of patients.

KING'S COLLEGE LONDON ARCHIVES



The new King's College Hospital at Denmark Hill was designed on the 'modified pavilion' basis.



## Thomas Clayton reflects on his year as President of King's College London Student Union (KCLSU)

It was 1 July 2012 and I was walking through the deserted corridors of King's, about to begin the most testing, yet rewarding, year of my life, as President of KCLSU. I'd had an amazing three years studying history at one of the best departments in the country and I'd fully taken advantage of everything university life had to offer. Like the three vice-presidents, I'd run in the election because I wanted to make sure that everybody had the chance to have as good an experience at university as I had. It hadn't been an easy job to get; we had run against 50 other candidates in a two-week election, trying to persuade 24,000 students that we were the best people for the role. It had been an experience that had brought us together as a team and made us more determined to take the opportunity and make a difference.

Whilst students weren't around, we certainly weren't slacking. To get ourselves ready, we underwent two months of training which taught us the skills, knowledge and context that we'd need for the job. We selected our campaigns for the year, planned freshers' week and picked every brain cell of our predecessors.

And then the year began in earnest: Freshers' Fair was upon us. We rented the Barbican Exhibition Centre and hosted 10,000 students over the course of two days. We have over 250 societies and sports clubs at KCLSU: each of them gets a small table and they vie to come up with the most creative ways of getting the attention of freshers, whether that's the Ancient History Society hosting a full-on gladiatorial combat, or the Gilbert and Sullivan Society trying to make their rendition of 'He is an Englishman' heard over the latest creation from the DJ Society next door. There's a give-it-a-go area where every hour a different activity group gives students a taster session, and we also lead tours of London so that students new to the city can find their bearings.

### **Working harder**

And then the real work began. It can't have escaped anyone's notice that this was the first year of £9,000 tuition fees for our undergraduate domestic first years. The impact has been immediately apparent; freshers are genuinely working harder than I have seen any other year group in my time at King's. Whilst their predecessors may have seen the first year as a gentle introduction to university life, this year's incarnation has seen it as an opportunity to make their mark academically. They also



*‘in the centenary year of Raising and Giving (RAG) our student groups raised over £160,000 for charity’*

ALFREDO FALVO



know that, in the current job market, a degree by itself isn't always enough, and we've seen a marked increase in membership of societies, sports clubs, student media groups and volunteering projects. There has also been a major effort to mitigate the effect of fees, with no fewer than 14 new outreach projects starting at KCLSU this year, working in the community to encourage children of all backgrounds to apply to university. The College have done their bit too. We worked with them to design a fantastic bursary scheme, and we're now looking together at tackling the cost of studying beyond tuition fees.

We've tried really hard this year to return KCLSU to its campaigning roots. We engaged over 1,000 students in the successful campaign to extend the opening hours of our libraries by 25 per cent. We've persuaded the College to radically reduce the number of classes taught on Wednesday afternoons, so that students can take part in all sorts of extra-curricular activities. We've successfully lobbied the College to invest in bursaries rather than fee waivers; putting £2.4 million into students' pockets in the last 18 months. We secured £10,000 of emergency funds from the College for postgraduate nurses when they had all their government funding cut. We've taken huge strides to tackle homophobia in sport and introduced a 'Safe Space' policy in our venues. And we helped the College to listen to and act on the concerns of students to a proposed School merger.

### **Rant Week**

Each of these campaigns has had students involved at every stage, and lots of the ideas for them came from our annual Rant Week, when over 1,000 students told us how they think the College and the Union could improve. We've run evidence-intensive, relevant,



on-campus, engaging and successful campaigns that our students have been able to support, and I'm proud of what we've achieved.

That's not to say that it's all been hard work. It's been a great year for sport, with no fewer than 18 league wins and record-breaking seasons for women's rowing and Guy's, King's and St Thomas' (GKT) football. The Macadam Cup – the annual day of fixtures between medics and non-medics – went down to an 8-8 draw, with the medics winning the tie-breaking tug of war. Our Women's Volleyball team came 11th in Europe; our TV station won best newcomer award and, in the centenary year of Raising and Giving (RAG), our student groups raised over £160,000 for charity.

### Best in the world

So what have I learnt this year? King's students work hard and they play hard; and now, more than ever, I believe that King's students really are the best in the world. They're never afraid to get involved and they're eager to improve the world around them. So often they have to juggle multiple pressures: their course, their extra-curricular life and increasingly their part-time jobs, internships and perhaps even carer duties.

Looking ahead, I'm immensely optimistic about the future of KCLSU. We've got a great team in 2013-4: Sebastiaan Debrouwere (President), Areeb Ullah (Vice President, Academic Affairs), Anthony Shaw (VP Representation and Communications) and Liam Jackson (VP Activities and Facilities). They've got plenty of challenges ahead of them: the recently-announced government cuts to bursaries, unregulated international and postgraduate fees and the first ever multi-sport varsity against UCL to name just a few.

I hope they will continue to have the positive relationship and support that we've enjoyed from the College; in an ever-increasingly competitive world, a genuine partnership between students and the College can only be beneficial for everyone. Student unions are often described as a critical friend of their institutions. In the past I think KCLSU has veered between the two poles of critic and friend, I believe that we're finally finding the right balance.





World questions | KING's *answers*, the King's fundraising campaign, was publicly launched in 2010. It is one of the three largest campaigns launched by UK universities. With the support of alumni and other supporters around the world, trusts, foundations and other friends, it is improving the lives of students and staff on our campuses and is supporting research addressing some of the world's most challenging problems, particularly in the areas of cancer, child health, neuroscience & mental health, leadership & society, and the emerging world order.

Action Medical Research  
 Alzheimer's Brain Bank UK  
 Alzheimer's Disease International  
 Alzheimer's Research UK  
 Arcadia Fund  
 Arthritis Research UK  
 Association for International Cancer Research  
 The Atkin Foundation  
 Dr Timi Austen-Peters  
 Australian Civil-Military Centre  
 Autism Speaks  
 Avantha Group  
 The late Miss Edith Baer  
 Baillie Gifford & Co  
 BASF SE  
 Belvedere Trust  
 Big Lottery Fund  
 Breakthrough Breast Cancer  
 Breast Cancer Campaign  
 British Heart Foundation  
 British Skin Foundation  
 British Society for Haematology  
 The late Mrs Elizabeth Brown  
 The Byron Society  
 Cambridge University Press Journals  
 Cancer Research UK  
 Carnegie Corporation of New York  
 Catkin Pussywillow Charitable Trust  
 CHDI Foundation, Inc  
 Professor William Chen and Dr John Chen  
 Cicely Saunders International  
 Circulation Foundation  
 The Clothworkers' Foundation  
 John S Cohen Foundation  
 Content Guru Ltd  
 The High Commissioner For The Republic Of Cyprus  
 Cyril Erskine Marshall  
 Dhammakaya International Society of the UK  
 Diabetes UK  
 Dimpleby Cancer Care  
 Dorset Foundation  
 The Marquess of Douro OBE & The Marchioness of Douro OBE  
 Dunhill Medical Trust  
 eBay Inc  
 ECTRIMS  
 The Eranda Foundation  
 Espirito Santo Financial Group  
 European Foundation for the Study of Diabetes  
 FIGCI  
 Florence Nightingale Foundation  
 Fondation Leducq  
 Foundation of European Nurses in Diabetes  
 Galliard Homes Ltd  
 Gapper Charitable Trust  
 Bill and Melinda Gates Foundation  
 The John & Lucille van Geest Foundation  
 Douglas Glanfield Memorial Trust  
 Global Business Services Ltd  
 Goldman Sachs Gives  
 Guy's & St Thomas' Charity

MICHAEL DONALD



Members of the King's Boat Club keep fit thanks to new rowing machines purchased with campaign help.

**Enriching the student experience**

The campaign has made possible many projects that enrich students' experience at King's. In particular, the historic Somerset House East Wing has been refurbished to create a modern and very elegant university building, formally opened by Her Majesty The Queen in 2012. Several student clubs have received funds to help them offer expanded educational experiences for students, as well as opportunities for recreation and stress reduction. The campaign has supported the award-winning student *King's TV* station, the Boat Club, programmes aimed at widening the social range of students applying to King's, and the King's College London Think Tank. This unique student society is the first student-led policy institute in London, founded in 2010 in the wake of the student protests as a way of giving students a means of contributing to the debate on issues which concern them and opportunities to gain valuable experience and knowledge from the leading experts who come to speak at the College.



The Worshipful Company of Apothecaries is supporting students like these from the King's Extended Medical Degree Programme.

### Philosophy and medicine

A grant from the charitable foundation established by Dr Peter Sowerby (who graduated in Medicine from Guy's in 1950) has enabled King's to establish the Peter Sowerby Chair in Philosophy & Medicine: the first in this area. The new professor will build on the College's groundbreaking work in this field to develop a programme of research, teaching and public engagement that moves beyond the traditional boundaries of medical discipline and practice in order to understand wider cultural and philosophical questions relating to health. Areas of research will include the nature of the body and the mind, evidence-based medicine and the role of the physician.

'Medical professionals encounter daily the subjective experience of their patients and reflect deeply on it; yet their training tends to focus only on the causes and treatments of illness,' explains MM McCabe, Professor of Ancient Philosophy at King's. 'Philosophers, on the other hand, are normally more concerned with abstract than practical issues. But philosophers and medical professionals are concerned with some of the same profound issues: life, health, death, identity, the nature of value. So there is a great deal to be gained from ensuring that these two disciplines engage with each other.'

Dr Sowerby commented: 'As a GP, I have long been fascinated by the potential for philosophy to inform medical practice. I'm delighted to support this new initiative, particularly given that I studied medicine at Guy's Hospital.'

### Supporting LLM students

Two donors have recently established scholarship funds to help LLM students in the College's Dickson Poon School of Law.

Bosco Tso (who graduated with an LLB from King's in 1987) created the Bosco Tso and Emily Ng Scholarship to support several students working toward their master's degrees in law. The scholarship will cover full tuition fees and provide an allowance for living in London. It will support students who otherwise could not have considered pursuing a university degree, and

ensure that the best and brightest scholars are able to devote themselves exclusively to their study at King's.

The Nigerian Law Scholars Fund has been created by an anonymous donor to help students from Nigeria pursue their LLM degrees at King's. These scholarships, worth £25,000 each, will be awarded on the basis of a personal statement as well as demonstrable financial need to Nigerian residents who are intending to return to Nigeria and are willing to share the skills they have gained while studying at King's.

### Finding future medical professionals

Support from the Worshipful Society of Apothecaries is helping the College's Outreach for Medicine programme to work with school children in more than 500 non-selective state schools and sixth-form colleges in Greater London and Kent, providing tailored educational and mentoring activities to encourage students to consider careers in medicine.

The 395-year-old Society has joined the outreach programme's principal sponsor, the Worshipful Company of Barbers, in helping thousands of young students to realise that they may have the potential to become doctors. The programme also introduces young students to King's Extended Medical Degree Programme (EMDP), which allows some admissions to the King's medical degree for pupils from disadvantaged schools with A-level grades that may be lower than those normally expected, and provides these students with an extra year to complete the first two phases of the degree course. Many EMDP students go on to graduate in the top 10 per cent of their year group.

'The Society of Apothecaries has been involved in medical education and standard-setting for nearly 400 years,' says former Master Apothecary Dr Timothy Chambers OBE (who graduated in medicine from King's in 1969). 'The Society welcomes the opportunity to contribute to the Outreach for Medicine programme, which has enlarged access to undergraduate education in an imaginative and successful way, allowing young people to achieve more than they might have dreamed of.'

GW Pharmaceuticals Ltd  
 Lord Philip Harris FKC & Dame Lady Pauline Harris  
 Health Foundation  
 Heathside Charitable Trust  
 The Hellenic Foundation  
 Hereditary Disease Foundation  
 Christine Hewson Memorial Foundation  
 Mr Geraint Hughes AKC  
 The Inman Charity  
 Interfarma  
 iPierian, Inc  
 Janssen Pharmaceuticals N.V.  
 The Japan Foundation  
 Mr Changqun Ji  
 Johnson & Johnson  
 Juvenile Diabetes Research Foundation  
 Kay Kendall Leukaemia Fund  
 Konrad Adenauer Stiftung  
 The Lau Family  
 The Betty Lawes Foundation  
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 A G Leventis Foundation  
 Leverhulme Trust  
 John D & Catherine T MacArthur Foundation  
 Maudsley Charity  
 Mayer Brown  
 Medical Research Foundation  
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 The Moss Family Charitable Trust  
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 The Charles Wallace India Trust  
 The Waterloo Foundation  
 Wellcome Trust  
 The Felicity Wilde Charitable Trust  
 Maurice Wohl Charitable Foundation  
 The Charles Wolfson Charitable Trust  
 The Wolfson Foundation  
 P C Woo & Co  
 The Worshipful Company of Barber Surgeons  
 The Yeoh Family

## Global reach

Through the campaign, donors have supported the College's international strategy and helped raise King's global profile. World questions|King's *answers* truly has an international reach – both in terms of providing students with an education that will prepare them for a world in which national boundaries mean less, and also through nurturing a greater understanding of the 21st century's emerging powers amongst a wider audience.

In particular, gifts to King's have supported the establishment of the College's four country-specific institutes focused on Brazil, China, India and Russia, as well as institutes looking at North America and international development. As described on pages 26-33, the Global Institutes are helping policy-makers to develop a stronger appreciation of the dynamics of change, especially in rapidly growing economies, and to foster a more nuanced awareness of mutual concerns and interests among the world's leading economies. They are also bringing leaders from government, media and cultural organisations to King's campuses, speaking to large audiences of students hungry to learn more about emerging world powers. In the past year, for example, the Brazil Institute hosted Alex Ellis, the new British Ambassador to Brazil, and broadcaster Michael Palin, who shared observations from his recent BBC documentary series profiling Brazilian culture and the country's rise as a global power. The India Institute's Tagore Centre for Global Thought, supported by the Ministry of Culture, Government of India, was inaugurated in April 2013 at Somerset House East Wing by Chandresh Kumari Katoch, India's Minister of Culture, and Dr Virander K Paul, Deputy High Commissioner of India in London.

The institutes have also provided a platform for the College's experts to share their knowledge with others. Professor Sunil Khilnani, an internationally recognised expert on contemporary India, is serving as Director of the India Institute through the generosity of an endowed chair established by India-based Avantha Group and its Chairman, Gautam Thapar. As the College's Avantha Professor, and a much in-demand commentator, Professor Khilnani has raised the visibility of both the College and the India Institute.

Michael Palin spoke at King's in April 2013 about his experiences of Brazil, as part of the King's *answers* lecture series.

MATILDA EGERIE COOPER





# Student numbers by School and level of study

Headcount on 1 December 2012

School	Campus	Number of students				Total	% of total
		UNDERGRADUATE	POSTGRADUATE				
			Taught	Research			
Arts & Humanities	Strand	2,900	964	629	4,493	17.8%	
Biomedical Sciences	Guy's, Waterloo	1,847	306	194	2,347	9.3%	
Dental Institute	Guy's, Strand, Denmark Hill, Waterloo, St Thomas'	760	365	83	1,208	4.8%	
English Language and other centres	Strand	186	0	0	186	0.7%	
Global Institutes		0	103	41	144	0.6%	
Institute of Psychiatry	Denmark Hill	71	657	309	1,037	4.1%	
King's Learning Institute		48	395	9	452	1.8%	
Law	Strand	920	895	77	1,892	7.5%	
Medicine	Guy's, St Thomas', Denmark Hill	2,569	577	411	3,557	14.1%	
Natural & Mathematical Sciences	Strand	1,243	301	191	1,735	6.9%	
Nursing & Midwifery	Waterloo	2,195	756	60	3,011	12.0%	
Social Science & Public Policy	Strand, Waterloo	1,821	2,224	594	4,639	18.4%	
Incoming Study Abroad students*		437	46	3	486	1.9%	
<b>Grand Total</b>		<b>14,997</b>	<b>7,589</b>	<b>2,601</b>	<b>25,187</b>	<b>100%</b>	

\*The full-year figure for incoming Study Abroad students in 2012-13 was 768.

## Members of staff on 1 January 2013

excluding senior students, honorary and occasional staff

School	Academic and research staff	Other staff	Number of employees
Arts & Humanities	375	388	763
Biomedical Sciences	360	184	544
Dental Institute	274	91	365
Institute of Psychiatry	694	259	953
Law	67	92	159
Medicine	999	428	1,427
Natural & Mathematical Sciences	167	64	231
Nursing & Midwifery	125	72	197
Social Science & Public Policy	319	190	509
Professional Services	42	1,396	1,438
<b>Grand Total</b>	<b>3,422</b>	<b>3,164</b>	<b>6,586</b>

# Students' country of domicile 2012-13

King's has a strong international community including students from some 145 countries worldwide

Domicile	Number of students	% of total
United Kingdom	17,192	68.3%
European Union	3,130	12.4%
Overseas	4,865	19.3%
<b>Total</b>	<b>25,187</b>	<b>100%</b>

# Student numbers by age at start of programme 2012-13

Age	Number of students				Total	% of total
	UNDERGRADUATE	POSTGRADUATE				
		Taught	Research			
20 and under	10,752	45	0	10,797	42.9%	
21 to 29	2,985	4,782	1,508	9,275	36.8%	
30 to 39	761	1,758	710	3,229	12.8%	
40 to 49	396	743	261	1,400	5.6%	
50 and over	103	261	122	486	1.9%	
<b>Grand Total</b>	<b>14,997</b>	<b>7,589</b>	<b>2,601</b>	<b>25,187</b>	<b>100%</b>	

# Student numbers by gender 2012-13

Gender	Number of students				Total	% of total
	UNDERGRADUATE	POSTGRADUATE				
		Taught	Research			
Female	9,473	4,558	1,386	15,417	61.2%	
Male	5,524	3,031	1,215	9,770	38.8%	
<b>Grand Total</b>	<b>14,997</b>	<b>7,589</b>	<b>2,601</b>	<b>25,187</b>	<b>100%</b>	

# Facts & figures

# Consolidated income & expenditure account

For the year ended 31 July 2013

King's credit rating was confirmed by Standard & Poor's as 'AA/stable' for 2013.

	2012-13	2011-12
	£000	£000
<b>Income</b>		
Funding body grants	130,671	140,908
Tuition fees and education contracts	174,581	146,544
Research grants and contracts	164,025	154,745
Other operating income	111,276	103,832
Endowment and investment income	6,395	8,191
<b>Total income</b>	<b>586,948</b>	<b>554,220</b>
<b>Expenditure</b>		
Staff costs	349,889	324,604
Other operating expenses	190,659	161,152
Depreciation	24,602	24,654
Interest payable	12,233	12,297
<b>Total expenditure</b>	<b>577,383</b>	<b>522,707</b>
Surplus on ordinary activities	9,565	31,513
Taxation	–	(8)
<b>Surplus on ordinary activities after taxation</b>	<b>9,565</b>	<b>31,521</b>
Receipts from property transactions	–	5,060
Profit on sale of shares	–	7,054
<b>Surplus after depreciation of assets at cost and tax</b>	<b>9,565</b>	<b>43,635</b>

# Finances



## VISITORS TO KING'S

Because of its distinction, connections and central London location, King's attracts many eminent visitors and speakers. Among those who visited in 2012-13 were Nobel Prize winners **Professor Sir Paul Nurse** and the former Archbishop of Cape Town **Desmond Tutu**; the former Archbishop of Canterbury **Rowan Williams**; the former Prime Minister **Sir John Major**; the former Chief Justice of England and Wales **Lord Judge**; the Chief Rabbi **Lord (Jonathan) Sacks**; the Archbishop of Westminster **Vincent Nichols**; Government ministers **Michael Gove**, **David Willetts**, **David Laws** and **Lord Taylor**; senior civil servants including **Martin Donnelly**, Permanent Secretary of the Department for Business, Innovation and Skills, and **Sir John O'Reilly**, Director General of Knowledge and Innovation; **John Cridland**, Director General of the Confederation of British Industry; **Professor Dame Sally Davies**, Chief Medical Officer for England; international statespeople including **Leon Panetta**, US Secretary of State for Defense, **Joaquin Almunia**, Vice-President of the European Commission, Brazilian Foreign Minister, **Antonio de Aguiar Patriota**, and the Minister of Culture for the Government of India, **Chandresh Kumari Katoch**; Olympic gold medallist **Dr Katherine Grainger**; FA Chairman **Greg Dyke**; England Football Manager **Roy Hodgson**; writer **Bill Bryson**; broadcaster and travel-writer **Michael Palin**; Director of the National Theatre **Sir Nicholas Hytner**; celebrity chef **Heston Blumenthal** and Dragon's Den winner **Levi Roots**.

## REPORT readers' questionnaire

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